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ORIGINAL ARTICLES.

PRELIMINARY REPORT OF AN OPERATION FOR THE FORMATION OF AN ARTIFICIAL PUPIL THROUGH THE SCLEROTIC COAT OF THE EYEBALL.

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OF PHILADELPHIA.

If reference is made to v. Hippel's article on a "New Method for Corneal Transplantation" (Graefe's *Archiv*, vol. 34, Part I., p. 108), it will be found that the author admits that this operation is only adapted to partial corneal leukoma (a condition, in my judgment, not warranting the operation). In fact, I should consider it never indicated if an iridectomy could be substituted for it, but in those cases in which the cornea has become opaque in its entire diameter, with adherent iris, and in the staphylomatous corneæ, the operation is not advised. Now, it is in these cases, and in others in which the natural passage of light to the retina is prevented by the destruction of cornea, iris, lens, and ciliary changes, that some operative relief is so much needed, and as yet no treatment has been proposed.

The vast majority of the blind are so from diseased conditions affecting the anterior part of the eyeball, and many of these eyeballs show good light-perception, showing that the nerve part of the eye has some vitality. The question arises, Can anything be done to help such cases that are now considered hopeless? I have performed the v. Hippel operation on two such cases in the past few months.

The first case was a man, æt. forty-four. The right eye was an atrophied stump, without light-perception, entire front of eye destroyed. Left eye: moderate atrophy of eyeball, cornea entirely destroyed and replaced by inflammatory tissue; iris and lens destroyed, moderate light-perception and projection; in this condition for twenty years (cause, purulent conjunctivitis), a hopeless case by our present methods. With v. Hippel's trephine I removed a central button of tissue, and went as deep as possible, until the oozing of the fluids from the interior of the eyeball caused me to stop, although opaque tissue still showed itself in the canal. A graft from a rabbit's cornea was placed in this opening, not with the idea of a visual result—an impossibility, by reason of the fact that opaque tissue remained in the canal—but to ascertain if union could take place under the existing conditions, of a free oozing of the eyeball fluids. Rapid union of this graft resulted, but it soon became opaque, and so remains.

The man thinks his eyesight improved; but, if so, it is due to the fact that so much opaque tissue was removed by the trephine as more than to equalize the opaque corneal graft. Of course, it will be said that this was not a proper case for the v. Hippel operation; but, unless this operation covers more than the removal of a partial corneal opacity, it has no field at all.

The second case was a child, æt. four, with a large anterior staphyloma of both eyes, due to corneal ulceration and destruction following an attack of measles. Here, again, was a case of loss of cornea, iris, and lens, but good light-perception was present in the left eye. Through the left staphyloma a central opening was made by the v. Hippel trephine, and extended inward until a dark ground showed itself through the thick inflammatory tissue, and a rabbit's corneal graft inserted. This quickly became adherent, but, unfortunately, also opaque.

These two operations convinced me that it was an absolute necessity to trephine inwardly until a transparent media was reached, even if it was necessary to enter to a considerable depth.

The next indication to be met was, How to block up such an artificial opening with a transparent media, one which would not be washed off by the oozing eyeball fluids, and one which would remain transparent (a rabbit's corneal graft became an impossibility under such circumstances). The idea occurred to me that the conjunctiva close to the cornea, in a normal condition, is nearly transparent. Then why not use a conjunctival flap from that part of the eyeball? This would also have the great advantage of a broad base to support it in position and keep it alive, and this free end could be stretched across the new opening, and held in position by stitches.

As to the best position for the artificial opening? Through the anterior part of the eyeball (the natural seat of the cornea) would be found the products of the former inflammatory attacks, and this would increase the risk of closure of the new opening. The advantage would be central vision. But why not boldly *trephine through the sclerotic coat posterior to the ciliary bodies*? Here the tissues would be more normal, and the chance of a clear vitreous greater; but, of course, eccentric vision. My experiments were made on rabbits' eyeballs.

Summary of experiments.—The eyeballs were washed with a biniodide of mercury (Panas) solution, and a two per cent. solution of cocaine applied. In-

struments were washed with alcohol. *Six operations* for artificial pupil through the *sclera*, posterior to the ciliary bodies, were made, the conjunctiva first being dissected away and inverted, and the rectus muscle divided. A v. Hippel trephine 4.5 mm. in diameter was used to make the scleral opening in four of these operations, in one of which two-thirds of the opening was made through the ciliary bodies without any additional irritation. This was interesting, as in the human eye a ciliary traumatism is looked on as generally fatal to the integrity of the eyeball, and the query would be whether a clean cut through the ciliary bodies, as an operative procedure, would not show a different result from a lacerated wound. In two operations I used a Graefe cataract knife to make two incisions in a triangular opening, the third side being cut out with the scissors (the trephine not being in order). These two pupils were of about the same area as the other four.

In all, there was a moderate vitreous escape, and in two a slight hemorrhage in addition. The conjunctival flap was then stretched over the scleral opening and stitched to the conjunctiva at the corneal border; the effort being made to have the conjunctiva nearest to the cornea to come over the opening on account of its greater transparency. The animal was then allowed to run without further care. All healed equally well. The conjunctiva for a few days was moderately swollen, but the eyeballs remained without reaction. Week by week the conjunctiva covering the scleral opening has become more transparent, and at time of writing (an average of five weeks after operation) the scleral openings show themselves like dark pupils, covered by a three-fourths transparent conjunctiva through which light can be reflected; there is no tendency in these openings to close, and the improvement goes on steadily as regards increase of the transparency of the pupil and conjunctiva. If the conjunctiva becomes again as transparent as it was in the normal condition (and there is every indication that it will be so), surely a most serviceable amount of vision will be obtained through these scleral pupils. The fact also that the eyeballs remain healthy is a strong point as to the feasibility of this operation on the human eye.

It is, therefore, fair to say that these experiments (as far as rabbit's eyes are concerned) prove that a large scleral pupil can be maintained without the least tendency to contract, and that the conjunctival covering will attain again to the normal transparency, and through this opening light can be reflected; also, that the eyeballs are not damaged.

In one of these operations, at the end of the fourth week, when the scleral pupil showed itself as a dark opening, covered with a three-fourths trans-

parent conjunctiva, I purposely dissected the new conjunctival flap away from the scleral pupil to determine the effect of depriving it of this covering. No vitreous escaped, but a lymph covering was in a short time spread across it and so greatly decreased its transparency. This would indicate that the conjunctival flap must be considered as a permanent covering.

Two operations for artificial pupil were made through the *entire thickness* of the centre of the *cornea*, with the same trephine. In one case the lens was injured and there was also an iris prolapse into the wound. This pupil was covered by a long narrow conjunctival flap taken from along the upper corneal border, and held in position by stitches through the cornea at the edge of the circular opening, giving the appearance of a narrow pterygium, stretching from above down to the centre of the cornea. The slight reaction was quickly over and the eye is now entirely free from irritation (six weeks after the operation) and in a normal condition, excepting a partial lens clouding and an iris prolapse, due to the operation. The conjunctival flap remains firmly attached to this corneal pupil, but is opaque, and will probably remain so, due to the fact that the conjunctival flap is not so well nourished.

The second corneal pupil operation was through the centre of the entire cornea also, and a similar long conjunctival flap was stitched over the opening, the stitches going through the edge of the cornea at the circular opening. This operation is following the course of the other, and will probably show the same result. In this case a more severe reaction was noted.

Summary of corneal pupil operations shows that a large corneal pupil can be made and covered by a permanent conjunctival flap, but this flap will probably remain

I now considered that I was justified in performing this operation on the human eye, particularly as I was attacking an eye utterly hopeless under our present methods. In trying the v. Hippel trephine on an enucleated human eyeball, I found that it had not sufficient power to penetrate the sclera and, therefore, had a spring of greater strength inserted. This also was insufficient, and I then tried as a motor power the dental engine with trephines of 4.5 mm. diameter adapted to it. This was found more delicate in its manipulation and in every way satisfactory, and was used in the two following operations:

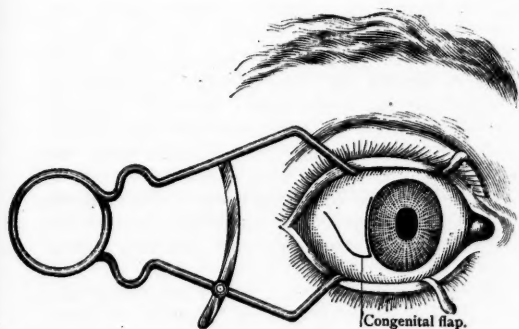
On December 4th I made two scleral pupils on the human eye.

CASE I. was that of a man, æt. forty-six, who had lost his right eye in boyhood by an accident, and this had been removed four years ago as an irritable stump, producing sympathetic irritation. The left eye had been losing sight for the past ten years,

and for the past four years had only light-perception, due to the sympathetic irido-choroiditis with cataract formation. Four months ago I attempted the lens removal, and had a violent escape of fluid vitreous at the stage of iridectomy, at which point the operation was stopped. Inflammation followed, with complete pupillary closure later on. Iridectomy was attempted without result, and the eyeball slowly began to atrophy with a —2 tension at the present time of operation.

The man was placed under ether, and a conjunctival flap (vide Fig. 1) was made by grasping the

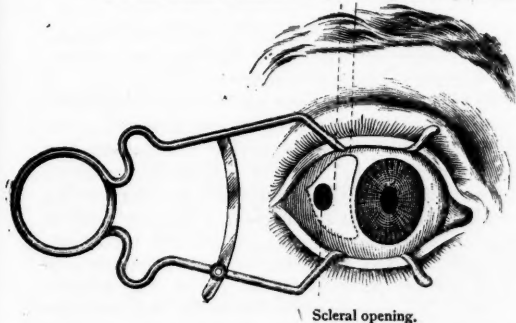
FIG. 1.



conjunctiva with forceps and making a horizontal cut close to the outer lower quarter of the cornea,

FIG. 2.

Insertion of tendon of rectus externus. Congenital flap inverted.



The dotted line represents the conjunctival flap sutured in position.

and then extending this upward along the outer corneal border; a third cut from this horizontal incision upward and outward, extending to the upper border of the tendon of the rectus externus, completed the flap. This was inverted and the rectus externus tendon severed; a forceps then firmly grasped the insertion of the rectus tendon any pulled the eyeball inward and held it steady. The trephine knife (having 4.5 mm. diameter and worked by a dental engine) was then placed on the sclera behind and close to the rectus externus ten-

don insertion, so as to avoid the ciliary bodies (vide Fig. 2), and a moderate rotation caused it to cut its way quickly into the vitreous. The button of the sclera was found clinging to the trephine on its withdrawal, and a quantity of straw-colored fluid escaped from the eyeball. The conjunctival flap was quickly placed over it and held by three stitches in its place; and a light bandage of cheese-cloth keeps the eyeball quiet, and thus far (six days) no reaction has followed whatever. Moderate swelling of the conjunctiva shows itself, but this already is rapidly passing away, and the dark scleral opening begins to appear.

CASE II. was that of a child, *æt.* four and one-half years; has lost both corneæ from ulceration following measles, three years ago; quite sizeable staphyloma corneæ are present, and it is thought that light-perception exists in the right eye.

A similar scleral pupil was made in the right eye, the patient being under ether, and in this case healthy vitreous escaped in moderate quantity. At this time (six days after the operation) no reaction exists. The staphyloma has entirely flattened, and the dark scleral pupil is seen through the still thick conjunctiva.

It is to be noticed, in the rabbit experiments, that a lapse of at least two weeks was needed before the conjunctiva became sufficiently thin to discern the scleral opening through it, so that no immediate result is to be expected until sufficient time has been given to allow a partial return of the conjunctiva to its normal condition.

Scope of the scleral operation:

1. As a means of making an artificial pupil in eyeballs now considered hopeless: for the purpose of giving vision.
2. It will be probably an efficient means of reducing staphyloma anterior by making a permanent opening, through which osmosis of the eyeball fluids may go on without injury, and in this way prevent intra-ocular pressure.
3. As a means of combating glaucoma in the chronic stages, by allowing free osmosis through the conjunctiva and scleral opening.
4. It may be useful in retinal attachments, by its ability to drain the retinal sac of its fluids through the scleral opening, and by keeping up osmotic action, lessen the risk of a re-separation.

In answer to the natural inquiry, How dangerous is this operation to the integrity of the eyeball? I will say that the rabbit experiments show that the risk is small, as no eye was damaged; and considering that the opening is made through a part of the eyeball posterior to the ciliary bodies, it is most probable that the operation will be attended with but little risk. But even taking the opposite view, it is always to be remembered that the eyeballs on which

the operation would be performed are, as a rule, such desperate cases that the element of operative risk will not give rise to anxiety.

In regard to what may be expected from the artificial pupil through the cornea—and by this is meant a pupil extending inward through all opaque tissue until clear vitreous is reached, at the present time I am inclined to believe that the conjunctival covering will, probably, not become transparent enough for any amount of vision through it, as it must necessarily be of sufficient length to reach to the corneal opening; and this means a larger dissection and a more narrow base to it: also, the risk of closure of the artificial opening is greater, as it passes through the seat of largest intensity of inflammation. But it may be found that actual experience on the human eye will give a different result.

I would have preferred to postpone this preliminary notice until I had a larger number of operations, with their results, to report; but the interest excited is so great, and I have been so beset by inquiry for information by members of the medical profession, that I take this method of giving my results as far as I have obtained them.

To my friend, Dr. Shaffner, who has kindly assisted me in my experiments on the rabbit's eyes, I make my acknowledgments.

FORCED RESPIRATION.

A Report of Six Cases, showing its Effects on Narcotized Human Subjects, and its Adaptability in Cases of Drowning and Shock.¹

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THE term *forced respiration* may be unfamiliar to many physicians; the reasons for its introduction are given. The term *artificial respiration* has been applied to all artificial methods alike, as those of Marshall Hall, Sylvester, Howard, and others, which depend for their success upon the movements of the limbs or body of the patient, supplemented usually by pressure of the thorax on the part of the physician; those in which tubes and mouth-pieces are used, and the air supplied by bellows of different forms, and the methods used on various animals in the physiological laboratory, in which the trachea is opened to supply the air for respiration. To the latter method, which, in operation, requires the forcing of air into the lungs by mechanical appliances, I have heretofore suggested the term *forced*

respiration, to distinguish it from the ordinary methods of *artificial respiration*. The necessity for a distinctive term and its appropriateness will be conceded, when it is noted that respiration has been successfully carried on in man by these forcible means for many hours after artificial respiration has proved futile. The operations are so different in application, that a distinctive term is absolutely required to prevent confusion.

For the history of forced respiration and description of original apparatus used by the author in the following cases, see forthcoming (1888) volume of *Proceedings of New York State Medical Association*.

CASE I.—At 12.30 A.M., July 23, 1871, was called to attend Mr. B. Found the patient in a semi-conscious condition. His wife reported that he had been drinking heavily. His excesses induced him to try chloral to produce sleep, but finding this unsuccessful he added twenty grains of morphine with the following result: The drug was taken late the preceding afternoon, so that sufficient time had elapsed to permit complete absorption.

When first discovered, he was breathing stertorously, and was with difficulty aroused. Emetics, followed by cathartics, were administered, producing vomiting. To keep the patient awake, he was dressed and two attendants walked him around the block. At each round atropia was administered. On the fourth round his limbs gave out, stertorous breathing was renewed, and he was carried into the house and laid upon the floor, as I believed, to die.

3.30 A.M.: Respiration failing, artificial respiration (Sylvester) was employed, and kept up at intervals without apparent benefit to the patient. I notified the family that the patient could not live. The last rites of the church were performed, a bed was prepared in the front parlor, the patient laid upon it to die, the data for the death certificate were obtained, and after confirming my opinion that death was imminent and certain, I left for home at five o'clock in the morning, completely exhausted. The pulse ranged from 180 to 200; respirations at 4 A.M. five per minute, and at 5 A.M. intermittent, or with a long intermission, followed by a few spasmodic respiratory efforts, and then apparent inanition for a time.

After a sound sleep at home, I was awakened about 8 o'clock A.M., by a call from Mrs. B. Dr. F. R. Campbell, who, through illness, was unable to respond to an early summons from Mrs. B., called at 8 o'clock, and finding Mr. B. still alive, sent for me.

On reaching the house, I found the patient with respirations not more than one per minute, and the pulse at the wrist difficult of detection. The extremities were cold, face cyanotic, pupils still contracted. My associate suggested more atropia hypodermatically, to which I assented. Together we repaired to a drug store near by, and had some

¹ Portion of a paper read before the New York State Medical Association, New York City, October 9, 1888.

powders prepared, but on our return found the pupils *widely dilated*; it is needless to say *no more* atropia was administered. The sudden dilatation of the pupils is a frequent occurrence in the *last stages* of opium poisoning, and is indicative of general muscular paralysis; it is, also, known as the "dilatation of asphyxia."

Dr. Campbell remarked: "We can do nothing more now." I agreed with him; but recalling the case of Mr. Dyke, and my views then entertained, I mentioned to the doctor my conviction that Mr. B.'s life might be saved by opening the trachea, placing a tube in it, and keeping up the respirations with suitable apparatus, until the poison could be eliminated. I informed him that I had the apparatus used on dogs in the laboratory of the college at my residence near by. He offered to assist, if I would make the experiment. I quickly obtained the apparatus, and on the way asked Dr. George H. McMichael to assist in the operation. The hemorrhage was considerable, but was controlled before incising the trachea. Difficulty was experienced in passing a ligature about the trachea and tube to prevent the air from passing up the throat; when accomplished, we were ready to begin the forced respiration. The blood coming from the incision was a dark coffee color, indicating an extreme venous condition. No respiration had been made for some time, and the dark blue tinge of the face had materially increased.

We began the forced respirations, which resulted in producing some remarkable physiological changes, which are recounted in that portion of this article relating to the effects of forced respiration on narcotized human subjects. After the first inflation of the lungs not the slightest expiratory effort was made, indicating not only the paralyzation of the respiratory centres, but the loss of elasticity in the lung tissue, a most important, if not the most important, factor in expiration. These facts are fully explained in that portion of the article just referred to. In the course of time the patient revived and began to move uneasily about, starting hemorrhage through the loosening of the tube in the trachea. Three soldiers boarding in the house were quickly summoned, and performed efficient service in restraining the patient.

At twelve o'clock, mid-day, after the forced respirations had been under way *two and one-half hours*, an ordinary tracheotomy tube was substituted for the tube of the apparatus, and the patient allowed to breathe for himself.¹

The *second* case occurred September 20, 1887, and was cited in the *Lancet* of October 15, 1887. Dr. Länger, of the Vienna Hospital, took an overdose of morphine. An incision was made in the trachea, and the patient's life was saved by *forced respiration*. The operation was made after the reports of my first case (read before a section of the Medical Con-

gress at Washington) had appeared in the medical journals.¹

CASE III.—Mr. J. A. V., aged forty-three, took two ounces of laudanum and some chloral about 9 or 10 P. M., Saturday, December 10, 1887. At midnight, his wife heard him breathing heavily; she tried unsuccessfully to arouse him, and sent for a physician.

Dr. Lawrence G. Hanley was the first to respond, and was shortly followed by Dr. Jacob Goldberg.² The condition of the patient at this time, 1.15 A. M., indicated that a large dose of some powerful narcotic had been taken. Breathing stertorous; pulse 128; respirations 6, and pupils contracted. At 1.40 A. M., Saturday morning, I was called and found the physicians employing Sylvester's method of *artificial respiration*, and at their request assumed entire charge of the case.

2.20 A. M.: Natural respirations ceased, or would last but a short time without *artificial respiration*. Pulse 72 to 84, indicating satisfactory oxygenation of the blood; however, the notes³ taken at the time show that the natural respiratory efforts were irregular, deficient, and difficult to count.

Their inefficient character, even when supplemented with the *artificial respirations* of Sylvester, was indicated by gradually marked increase of cyanosis. Previous to this, when noticing the good results of the *artificial respiration*, I informed the physicians that this would be a good time to answer effectually those who believed that *artificial respiration* would accomplish what forced respiration would in cases of deep narcosis from poisons which act upon the respiratory centres. I informed those present that if the life of the patient could be saved by *artificial respiration*, or any other *known* means, my apparatus *should* not be used.

From 2.30 to 2.45 A. M.: Natural respirations ranged from 7 to 15 per minute, but were "shallow," so that little good was effected by them. Pulse 120.

3.25 A. M.: Respirations failed. Owing to evident signs of heart failure, it was considered by all the physicians present that the life of the patient demanded the application of *forced respiration*. Time was given to demonstrate the uselessness of *artificial respiration*, and it was feared the patient might succumb before the *forced respiration* could be applied.

3.40 A. M.: Tracheotomy made; blood venous; Dr. Hanley remarked that it was "ebony-colored."

4.05 A. M.: *Forced respirations* begun. In a short time, the pulse became stronger, and was reduced to 78 per minute.

5.30 A. M.: Pulse 102.

5.45 A. M.: Pulse 64.

6.25 A. M.: The patient, *previously insensible*, opened his eyes, stared in a half-dazed manner,

¹ November 12, 1888: Have just received from Prof. Böhm, of Allgemeines Krankenhaus, Vienna, a full report of this case.—G. E. F.

² Dr. Samuel Goldberg was present later in the case. Also a number of medical students.

³ This case is reported from full notes taken during its progress by the different physicians present.

¹ The analysis of the urine first drawn from Mr. B. gave clear evidences of morphia. A quantitative analysis is now being made by Dr. John A. Miller, of Niagara University. Buffalo, as a matter of interest.

raised his head from the pillow, and recognized Dr. Goldberg by voice only.

6.45 A. M.: First noted that when *forced respiration* is discontinued not the slightest attempt at breathing is made by the patient, even when the cyanotic condition is extreme.¹

In one or two instances the *forced respirations* were unintentionally kept up when the patient was swallowing water; the glottis being opened at this time, it entered the lungs and was subsequently coughed up and passed out of the opening of the valve of the apparatus.²

7 A. M.: Pulse 96.

8.15 A. M.: Pulse 108. It was found that the patient could breathe for himself, but only for a short time, and the *forced respirations* had to be continually kept up.

9 A. M.: The trachea tube not being secured tightly in the trachea, permitted quite an amount of blood to pass into the lungs, and the air to pass into the mouth, so that the lungs were not thoroughly inflated at each respiration. This blood gurgled ominously at each inspiration. With a curved needle another ligature was passed and tightened about the trachea and tube. The *forced inspirations* following, markedly improved the action of the heart.

As the poison became more completely incorporated with the blood, through absorption, the effect of even a short stoppage of the *forced respirations* was indicated in a weaker action of the heart. At one time, the rubber tube connecting the respiratory valve with the trachea tube became almost completely clogged with clotted blood. It was removed and cleaned, as was also the inner tube of the tracheotomy tube a number of times. Digitalis was given, also atropia, one-eighth grain at one time, and smaller doses also. No dilatation of the pupils took place at this time.

The question of keeping up the *forced respiration* when there seemed to be no prospect of ultimate recovery of the patient, was *seriously* discussed. I was urged to discontinue the respirations on account of the case being considered hopeless. At one time, I stopped them for a longer period than usual, thoroughly discouraged and tired. The man was not dead, and we *had to keep it up*.

11.30 A. M.: Patient drank some brandy and water; vomited. Case was hopeless.

12 M.: Pulse 117. Grain $\frac{7}{8}$ atropia administered hypodermatically.

12.10 P. M.: Face cyanosed; efforts to breathe made; twitching of toes; respirations not supplying enough air.

12.40 P. M.: Owing to a solution of atropia being placed on or in the eyes, the pupils gradually dilated.³ Pulse 126.

¹ See effects of forced respiration on narcotized subjects further on.

² This indicates, in part, the value of the application of the apparatus in cases of drowning, and also that it would be objectionable to pass a tube into the larynx by way of the buccal cavity when the elimination of poison is important, as liquid, in swallowing, would be apt to enter the lungs.

³ This may not have been judicious, but was done under the belief of all the physicians present that the patient could not recover.

12.55 P. M.: The patient, who had become unconscious for a short time, regained consciousness, and drank some water. Pulse, after drinking, 168, weak and flickering. After this, more air was administered, and three movements of the bellows used for the inspirations instead of two, as formerly.

3.20 P. M.: Temperature 100.5° Fah.

6 P. M.: Pulse 120.

6.15 P. M.: Respiration natural, 14 per minute. Patient began breathing for himself. This lasted fifty-five minutes, when the respirations lowering to 8 per minute, *at the request of the patient the forced respirations* were again proceeded with.

9.15 P. M.: Pulse 120; respirations 14, natural; becoming shallow, they were supplemented with the *forced respirations*.

11.30 P. M.: Pulse 100.

December 11, 1887, 12 Midnight: It is now twenty hours since the forced respiration were begun.

1.05 A. M.: Pulse 128, strong. The patient has been breathing for himself for the last four hours, but has *now requested* that the *forced respirations* be used for a time. Since then, he has breathed for himself. For over fourteen hours he could not be left to breathe for himself even for a half-minute, without evident discomfort and danger, viz., between 4 A. M., 10th inst., and 6.30 P. M., 10th inst., and for nearly seven hours thereafter the *natural* had to be supplemented by the *forced respirations*.

4 A. M.: Pulse 117. Although olei tigllii gtt. v have been administered, no movement of the bowels has taken place. Nutritive drinks and enemata of water, soap and water with oil and stimulants, given also.

Every six or eight hours catheter used. Up to 12.30 A. M., 11th inst., nearly twenty-four hours after the patient was first discovered, and some twenty-seven hours after two ounces of laudanum had been taken, not more than six ounces of urine had been drawn from the patient. This large amount of poison (two ounces) had been undergoing the round of the circulation, producing its maximum effect on the whole system. The left arm was partially paralyzed, the brain congested.

Between 3 and 4 A. M., 11th inst., the bowels moved for the first time. At 7 A. M. the patient left the table, without assistance, to use stool. At 9 A. M., the tracheotomy tube was removed, wound plugged antiseptically, and patient put to bed.

Although very seriously ill for three or four days following, no serious lung difficulty set in; the patient has fully recovered.

CASE IV.—Julius B., of Lockport, N. Y., aged forty-five years, nervous temperament, of a naturally lively disposition, was subject, through ill-health and mental suffering, to spells of melancholy, which were aggravated by several serious reverses in business. He was of medium height, weighed about one hundred and thirty-five pounds, and was in poor condition to withstand a terrible physical ordeal. January 24, 1888, he left home for Buffalo, having previously obtained a two ounce vial of laudanum. On his arrival at Buffalo he put up at the Continental Hotel, complained of not feeling well, ate very little supper and retired to his room. This was the

last time he was seen, until he was found next day at 3 P. M., to all appearances dead (so reported).

The first physician to arrive at the hotel was Dr. Luther Phillips, who, on examination, gave up the patient. The physicians from the Fitch Emergency Hospital, Dr. George E. Penrose in charge, next appeared and administered brandy and ether subcutaneously. Drs. William A. Hoddick, Carlton R. Jewett, Herman Mickle, John D. Flagg, and several others subsequently were present during the progress of the case. They, without exception, gave up the case as hopeless. Coroner Kenny was summoned, and before leaving his office telephoned to undertaker Rodney to go to the hotel with a coffin, which he did.

The two ounce vial of laudanum was found empty; the throat of the patient was cut, severing the trachea and anterior jugular vein; it was found also that the left arm had been incised with a razor so as to expose clearly, without opening, the basilic vein. At this time the patient was making a faint gasp once in about ten seconds and breathing through the hole he had made in the trachea.

I was called about 5 P. M. On arrival found the corridor and bed-room filled with physicians and laymen, the patient lying on the right side of the bed. To indicate the extent of hemorrhage, it may be mentioned that the right side of the over- and under-shirt, the shirt sleeves to wrist, right end of the pillow, and side of the mattress were literally soaked with coagulated blood. A tall slop-jar at head of bed was half-full of blood and water. The pupils were contracted; face pallid; an occasional gasp indicated that life existed. No pulse at wrist, and fluttering movements of heart on auscultation; skin cold; patient unconscious, had an exsanguinated cadaverous appearance. The physicians had ceased their efforts at resuscitation.¹

My first marked interest was in noting that the incision in the trachea was just suited to my tracheotomy tube, which I immediately inserted, causing a reflex inspiratory spasm. Within one minute from the time I entered the room I was practising forced respiration upon the patient. Within a few minutes the cyanotic hue slowly passed from the face. In about three hours, 8 o'clock P. M., the pulse could be detected at the wrist and the patient showed signs of returning consciousness. Great quantities of stercoraceous matter passed frequently from the patient. At 9 P. M. patient became fully conscious of his condition and surroundings. Contraction of the pupils continued. When forced respiration was discontinued an occasional attempt at respiration was made; at no time, however, during the twenty and a half hours the instrument was in steady use, did he make more than two or three attempts at respiration without it.

As he gradually became weaker from continued movements of the bowels and frequent attacks of

vomiting, attempts were made to nourish him. The most easily assimilable substances were rejected. Milk and lime-water, peptonized liquids, liquid and powdered peptonoids, iced champagne, brandy, etc., were used, but the stomach would not retain them. Vomiting continued; the patient approached the stage of collapse; brandy, hypodermatically, frequently given without marked benefit. The action of the heart was of a bounding, uncertain character, produced by deficiency of blood upon which to work. At one time stercoraceous vomiting set in; in fact, a most deplorable condition existed. It was decided to attempt the introduction into the circulation of a saline fluid by the transfusion method. I repaired to the Fitch accident hospital, secured the apparatus and assistance of Dr. Penrose, who, with Dr. Mickle, opened the conveniently exposed basilic vein of the left arm, introduced the transfusion canula and allowed about six ounces of the fluid to mingle slowly with the circulation.¹ No apparent change was noted in the condition of the patient from the injection; the forced respiration was continually kept up, and the life of the patient depended upon it, as all other means would have proved futile without it. At this time no pulse at the wrist could be detected for fifteen minutes at a time.

Continued the work through the night with the aid of my class of students from the college and a number of physicians; toward early morning the opinion prevailed that the case was hopeless.

I was urged to discontinue the work of resuscitation, on the plea shared by all, that it was only prolonging the misery of the patient, and the case was hopeless. I urged, as in my second case, that a physician was not justified in giving up until life was extinct, and kept the forced respiration under way. Attempts at nourishment by the stomach had been discontinued for a time after the stercoraceous vomiting. The nourishment of the patient, however, had become a matter for serious consideration, and at the suggestion of Dr. C. R. Jewett, half teaspoonful doses of Cibil's fluid extract of beef diluted with a little carbonic acid water were administered. This was the first substance to be retained; dose repeated, increased, and at last the patient showed signs of improvement.

Some twelve hours after we had been at work, the satisfactory result of forced respiration, as a means of breathing for a human being, was demonstrated in the easy, passive condition of the patient. During the forenoon the effect of the narcotic gradually passed away, the pupils dilating more and more. The condition of the patient was such, however, that he could not breathe for himself for any time without evident discomfort, and the forced respiration had to be kept up. Noon passed, and yet the patient could not be left to breathe for himself. At 1.30 P. M., however, nearly one full day (twenty and one-half hours) after forced respiration was begun, Mr. B. began to breathe for himself. In a few hours he became so fatigued that he begged to have the

¹ Dr. Wm. A. Hoddick reported the condition of the patient at the time of my arrival as follows: "Skin cold; cadaverous appearance; lips colorless; the pallor of death apparent; extremities cold; pulse almost imperceptible; only a slight fluttering of the heart could be discovered; eyes insensible to light, pupils completely contracted; but little blood in the body."

¹ The formula for this fluid was as follows: "R.—Sodic carb., grs. j; sod. chloride, grs. vj; ft. chart. aquæ, ʒ ij, M. xxx. Misce. Inject one to four ounces.

forced respiration resumed, and the little instrument was again called into action, quieting and easing the patient again. Several times was this done before he continuously breathed for himself, thus making the use of the instrument to cover more than a day before it was laid aside for good.

Toward evening the patient was transferred to a warmer and better room. Under careful treatment he rapidly improved, but complained of constant pain in his chest. It was feared that pneumonia would set in as the respirations were somewhat rapid. It did not, and there was nothing, as we will see, to indicate that the lungs were *unfavorably affected* by the long-continued forced respirations. Within five days after the operation the patient was transferred to the hospital of the Sisters of Charity, and his temperature was normal and pulse 96. The pain in the chest was caused by the *hypodermatic* injections given at a time when the circulation was so inactive in the surface capillaries that gangrene was produced by them. The poor fellow suffered for months after the operation from this cause. The greater portion of the left breast sloughed down to the ribs, and in the right thigh an abscess, produced from the same cause appeared, which, when opened on the 20th of February, gave out a pint of pus. There is, then, a possibility of overdoing the hypodermatic treatment where a large quantity of blood has been lost.

I do not hesitate to state as my belief that Mr. B. would have been in condition to leave the hospital within two weeks of the date of the operation had it not been for the results produced by the hypodermatic medication. At this time, following it, his throat was closed up and in good condition. He was able to walk about and do light work long before he left the hospital, and when he did so was in better physical condition than he had been for years.

Regarding my first three cases, there is no question as to the result had any other known means been tried to save them. Forced respiration alone is to be credited with the saving of these lives to future usefulness. To demonstrate beyond question the thoroughness of the work accomplished, at my request these patients, Messrs. Burns, Van Orden, and Baere, all in good health, appeared before the Western Division of this Society in Buffalo, May 8th of this year, where I gave a preliminary report upon the subject of this paper.

To the insurance companies this work was a boon, as it saved to them some \$23,000 assurance.

With all associated in the cases, I stand equally surprised at the results.

The following series in many respects are not so interesting as the first three, but still presenting the influence of forced respiration in these serious cases in a most remarkable light.

CASE V. is taken from the records of the Emergency Hospital, where it occurred, and is reported by the house physician, Dr. J. F. Mulherin. Hospital case No. 1000. Peter C., aged eighty, United States,

admitted May 18, 1888, 8.30 P. M. This man was brought in an ambulance from a house where he was found in a dazed condition. Patient had stated to friends at this place that he had taken laudanum, $\frac{3}{4}$ j; empty bottle shown to ambulance attendant. On admission patient unconscious, pulse full and strong (84 per minute), respirations about 10 per minute, pupils contracted to pin points.

Emetics administered, atropia gr. $\frac{1}{100}$ hypodermatically, and catheterization at 8.35 P. M.; repetition of atropia gr. $\frac{1}{100}$ in ten minutes. Artificial respiration, Sylvester's method. At 9 P. M. heart failed and respirations about 3 or 4 per minute; respirations gradually became imperceptible, atropia gr. $\frac{1}{100}$, also brandy and digitalis given hypodermatically.

At 11 P. M. Dr. Fell called and tracheotomy with forced respiration determined upon. Present, Drs. Fell, Heath, Mickle, and Mulherin. Trachea opened and tube inserted by Dr. Heath. At 10.25 P. M. forced respiration commenced: patient seemed to revive; pulse became fuller, was irregular, color in face returned, and at 12.15 A. M. patient first opened his eyes. Stomach-tube introduced to wash out contents at 12.30. Injections of soapsuds per rectum at 1 A. M. These were found inefficient, and gtt. ij olei tigllii administered at 1.15; urine again drawn at 1.45. Signs of returning consciousness at 2.30. Patient opened his eyes and lifted his hand. Between 2 and 3 condition good, pulse full and regular; vigorous slapping of face, yelling in ears elicited no response. 3 A. M. pulse 90. 3.45 A. M. patient suddenly raised his arms and attempted to speak. At this time the forced respiration was discontinued, but patient refused to breathe. At no time since the operation was begun had the patient been cyanotic.

At 4.15 A. M. patient again threw his arms about, and, in answer to a question, said he was "awake." Hæmostatic forceps removed from the neck after the vessels were ligated; slight hemorrhage. Respiration continued. 5 A. M. patient opened his eyes, became somewhat convulsed, and again relapsed into a state of unconsciousness. Two drachms of nitre given by the mouth and stimulants through the air-heating section of the apparatus. At 5.15 A. M. bellows working at the rate of 108 movements per minute; patient by this means receiving 21 respirations to the minute; pulse good, and color of face normal. 5.20 air-heating apparatus again used. 5.40 heated air discontinued. At 5.50 $\frac{3}{4}$ j urine drawn. 7 A. M. face and hands more cyanotic; pulse 90, temperature $99\frac{1}{2}^{\circ}$ F. 7.30 pulse growing weaker, patient somewhat cyanosed. 8.20 heart failing. 9 A. M. pulse 88. 9.10, heart very weak. 9.30 pulse varied, becoming alternately strong and weak. At no time during the operation has the patient been able to breathe of his own accord. At 10 A. M. pulse 90, temperature 98° F. Peptonized beef extract given per rectum. 12.45 P. M. patient made a few convulsive efforts to breathe, again relapsed into unconsciousness; pulse becoming very weak and feeble. Patient grew pale; skin cold. Complete cessation of pulse at 1.10. Patient dead. Forced respiration discontinued and instrument removed at 1.13 P. M.

In this case the patient was kept alive by the forced respiration for fourteen hours and ten minutes, and it is reasonable to infer that his life was prolonged at least twelve hours longer than it could have been by any other methods known.

CASE VI.—May 26, 1888, I was called to the residence of H. C. F. Found his eighteen day old infant held by a nurse in a tub of warm water; body deeply cyanosed. An occasional gasp indicated that life still existed; pupils contracted, reflexes absent. Inquiry elicited the following history: Dr. "Blank," an old and respected homœopathic practitioner of Buffalo, had been called to prescribe for the child. He took out of his case a powder containing morphia sulph. gr. j. By mistake he gave it to the nurse, directed her to give it to the babe, at the same time thinking he had replaced it in his case and handed her a harmless powder in its stead. Some time after the physician had left the house the nurse called the child's mother's attention to the superscription on the powder, morph. sulph. gr. j, and with the belief that all medicine was harmless, thinking it was only a sleeping powder, the fatal drug was placed upon the tongue of the little one at 12.45 P. M. and all absorbed.

At 2.30 P. M. the child was discovered in convulsions, a physician, Dr. A. M. Curtis summoned, and the usual steps taken to resuscitate. When it is considered that the quantity of morphine taken was equivalent to about seventy doses for an infant of this age, it appeared a hopeless task. From 2.30 until about 4.30 P. M. artificial respiration was used with little benefit. It was nearly 5 P. M. before I arrived at the house, and with difficulty only to be appreciated by experience I made tracheotomy. Previous to the trachea being reached respirations would cease, by placing my mouth over the nose and mouth of the babe and forcibly blowing, the lungs were inflated, resulting in keeping up the action of the heart until the trachea could be irritated.

Irritation of the trachea followed by incision seemed to stimulate the respiratory centres for some time, but, as the case was approaching a crisis, at last a small-sized catheter, one-eighth of an inch external diameter, was used to make connection with the trachea, and by an increasing series of larger tubes this was connected with the tube from the air-valve of the forced respiration apparatus. About 6 P. M. the forced respiration was begun, Dr. A. M. Curtis giving valued assistance in holding the small tube in the trachea. In fifteen to twenty minutes the cyanotic condition passed away; child steadily improved for an hour, when the cyanosis returned. Examination revealed that the tube had slipped out of the trachea. After replacing it, forced respiration was continued, and the natural hue of health returned. The pulse improved, ranging for a time up to 134 per minute. Drs. W. H. Heath and George W. T. Lewis were called in to assist. Natural movements of the limbs returned, reflexes were again established, the limbs moved, bowels acted freely, and eight or ten natural respirations were taken. Hopes for recovery were almost entertained from the re-

markable changes produced by the forced respirations, but at 9.10 P. M. pulsations indicated heart failure, and at 9.30 P. M. the heart ceased beating.

In this case, no less than in those preceding, the result of forced respiration was remarkable. The infant only eighteen days old had for five and one-quarter hours been subjected to the influence of one grain of morphine, in an asphyxiated condition for at least four and one-half hours, thus weakening the muscular tissue of the body. Under forced respiration life was retained, with the result mentioned, for three and one-half hours. If forced respiration had been instituted within the first two hours, it is probable the result might have proved different.

EFFECTS OF FORCED RESPIRATION UPON NARCOTIZED HUMAN SUBJECTS.

Observations obtained from various sources and the practice of forced respiration upon animals have given us a comparatively full knowledge of the physiology of respiration. The result of the same operation in the cases reported will, I think, add much interest to the subject, emphasize some points, and confirm others obtained by observation on the lower animals.

I present the conditions observed beginning with my first case, Mr. B. It will be remembered he had taken morphia, grs. xx. When forced respiration was first applied the patient was cyanotic. The effect of the respiration was observed much sooner on the heart than on the lungs. The change from the venous to arterial state of the blood was first noticed; the pulse at the wrist became stronger and quite regular some time before the attempts at respiration were made by the patient. Forced respiration was under way some twenty minutes before any attempts at breathing were made by the patient. A long interval elapsed before additional attempts were made. The ruddy hue of health returned to the face, and the first attempts at natural respiration were indicated by two or three quick, hurried movements of the lungs. These subsided and without both forced inspiration and expiration the patient would have quickly succumbed.

Sensibility was returning as indicated by reflexes of the ocular muscles. The next feature was movement of the limbs followed by one of the arms. Shortly after the eyes opened, staring wildly. Consciousness returned, the patient eagerly drinking water proffered to him. After about two hours' work the natural respirations became longer and longer, until they appeared almost normal.

The opening in the side of the valve (one-eighth by one-half of an inch), which permitted air to pass in for the natural respirations, was not large enough to supply the lungs with their full requirement of air, so that natural breathing could only be carried

on for a short time before dyspnoea would ensue. This was evidenced on the part of the patient by gasps and uneasy movements. When this occurred, the natural were supplemented by the forced respirations with the effect of always quieting and easing the patient.

When the *forced respirations* were kept up for a short time, and the blood became surcharged with oxygen, it would be some time before attempts to breathe were made—this was frequently observed; advantage was taken of this, and this condition was produced when the change from the cumbersome tracheal tube of the respiratory apparatus was made for an ordinary tracheotomy tube, and the patient allowed to breathe for himself.

In the variation in the number of respirations we find one of the most interesting and instructive features of the whole case. When the operation was begun at nine o'clock, Saturday morning, the rate was *less than one per minute*; when completed, three hours later, some *eighteen or twenty per minute*, and remaining at the normal number during the rest of the day. During the following night, they were again modified by the delirium, and the next day, or about twenty-four hours after the operation, had lowered to the unpleasant rate of *only six per minute*. Here they remained for a short time, then gradually came up to eight, ten, twelve, and fifteen, and two days after the operation became normal in number and action. This remarkable variation can most easily be explained by assuming that the shock and paralysis to the system had been almost completely overcome by the forced respiration; that the effect of the residual poison in the blood did not exert its influence under the forced respirations, but that in the following twenty-four hours, under the ordinary conditions of the system, the poison *remaining* again produced its effects; and had not the eliminative organs steadily continued to rid the system of the poison, secondary poisoning might have taken place with serious, if not fatal, results, or forced respiration might have had again to be resorted to. In all these cases it is interesting to note the marked difference in favor of forced respiration over artificial respiration in effects produced on respiratory centres. Where the latter will not suffice, the former should always be substituted before a fatal prognosis is rendered.

In Case III. the paralysis of the respiratory centres was more complete than in Case I. Two ounces of laudanum were fully absorbed. The patient had been kept alive three hours by artificial respiration, when the forced respiration was carried on for two and one-half hours before consciousness fully returned. Fifteen minutes after this it was noted that the patient would not make the slightest attempt to breathe when the forced respiration was discontinued. This was not apnoea (taking that meaning of the

term in which the respirations are discontinued by the surcharging of the blood with oxygen), but under the ordinary continuous operation of the apparatus. During the first six or eight hours of this case, the bellows were given two movements for inspiration, not furnishing sufficient air to supply the system with its full requirement of oxygen. The consequence was that cyanosis gradually increased until the face, neck, lips, eyelids, pinna of ears, and dorsum of neck gave marked evidence of it. In this condition, when it would seem that the tissues of the body would be demanding oxygen, not an effort would be made toward natural respiration when forced respiration was discontinued.

The most remarkable feature in this interesting case was that under this condition of marked paralysis of the respiratory centres and deep cyanosis the patient was *conscious*, and would respond to ordinary requests such as drinking when desired to; when asked to *take a long breath*, he would evidence the power of the will over the respiratory muscles or centres by responding with a good effort at inspiration. He would, however, immediately subside into his former lethargic state, and not make more than one voluntary effort at respiration. Cyanosis would increase and when the condition of asphyxia had been reached, extraordinary respiratory efforts were noted, but immediately subsided when the forced respiration was again substituted. Many persons besides the four physicians were present. This experiment was repeated a number of times in the presence of the physicians.

These facts, and those noted in connection with Case IV., give hopes that forced respiration may have a wider field than merely in cases of opium poisoning, and illustrate in a most interesting manner the marked difference in function between the medulla oblongata and cerebrum. In Case IV. the respiratory centres were not so completely paralyzed as in Case III. Owing to the great loss of blood the effects of the opium had almost passed away some twelve or fifteen hours after the forced respiration was instituted, but the vital energy remaining was not sufficient to enable the patient to breathe for himself until some twelve hours later. This is thoroughly attested. In this state the patient was as "quiet as a lamb" for long periods at a time, under the forced respiration, and after it had been discontinued requested the reapplication of it. It supplied a need in this case that artificial respiration, with its bodily movements, could not have done.

In the case of the old gentleman eighty years of age, who was reported to have taken *tr. opii ʒj*, the entire cerebral system seemed thoroughly paralyzed; the return of consciousness, compared with the other cases, was slow and lasted but a short time. Here old age had an influence, and the

tissues of the brain had, undoubtedly, lost their susceptibility to stimulation. In the case of the eighteen day old infant, the changes wrought by forced respiration were beyond comprehension; that a child in the state in which this was found could be made again to respond to the influence of any agent, so as to affect the entire system, after having been under the influence of so large amount of morphia seems almost incredible. I cannot ignore the grand results obtained by artificial respiration in many cases of opium poisoning, and could cite many remarkable cases; but feel from the short, although important, experience with forced respiration, that we have something more than a *dernier ressort* compared with artificial respiration, and all that is needed to demonstrate such to be the truth, is its application to suitable cases when presented. One fact which should be borne in mind is, that artificial respiration in extreme cases is always carried on at the expense of the patient's energy, and we might emphasize the fact that the physician expends *about all he has also*; whereas, in forced respiration, with an attendant to work the bellows, the patient is passive, and the physician has merely to press on a valve some eighteen times a minute. In a long-continued fight for life, this is a factor of no inconsiderable importance.

FORCED RESPIRATION IN DROWNING.

It is probable that forced respiration may come into application in all cases in which artificial respiration has been used and failed to keep up the action of the heart. In cases of drowning, we will find a favorable field for its use. All of the cases previously cited prove conclusively that the cephalic centres respond more readily to forced respiration than to artificial respiration. If I choose to make comparisons, I could show that the early return of consciousness in deeply narcotized subjects was greatly in favor of forced respiration. On this account, and the results I have already obtained, we must expect that in almost all cases of asphyxia, from whatever cause, forced respiration will be considered the most reliable agent we can apply. Where tracheotomy is always necessary, it may not be generally used. In drowning and many other cases tracheotomy need not be performed, forced respiration may be applied by intubation of the larynx or trachea.

I can best illustrate the method of applying it in drowning by presenting an imaginary case. A patient, removed from the water, lies still before us; slight fluttering of the heart indicates life; water may still remain in the lungs; with suitable forceps pull out the tongue, pass the flexible rubber tracheal tube, by aid of the trachea guide (a curved steel bar which hooks up the epiglottis and carries the tube back and presents it properly at the laryngeal open-

ing, and by which it is easily passed a short distance into the trachea; withdraw the tracheal guide, secure tracheal tube with tape about the neck, connect forced respiration apparatus, and you are ready to breathe for your patient. Now force a minimum amount of air into the lungs; if water be present, a gurgling sound will disclose it.¹ To remove it, invert the patient, raise the hips and lower the head, and if water be present the air will rise above it and force it out of the air valve. After this, replace in the dorsal position, apply heated and medicated air, water per enema, hypodermatic stimulation, etc.; but nothing by the mouth, for fear it might pass into the lungs. We have in drowning no *poison* to eliminate, therefore, no special need of eliminative medication by the stomach. As soon as the patient may be depended upon to breathe for himself, remove the tracheal tube and give liquid food by the mouth.

FORCED RESPIRATION IN SHOCK.

In shock we have the combined afferent nervous impressions proceeding from the injured terminals, producing a greater or less degree of paralysis of the central nervous system, through, or by which the various important functions of the economy are carried on. We do not have the respiratory centres almost alone paralyzed, as in opium poisoning, but we may include all the functional centres of the economy. Did we not have frequent evidence of recovery from shock, I would not feel justified in suggesting the possibility of keeping up or saving human life in such cases by forced respiration. I offer the cases of Mr. Baere and Mr. Van Orden as instances from which it is reasonable to infer that forced respiration may be expected to give results in shock to be obtained by no other means.

72 NIAGARA ST., BUFFALO, N. Y.

TWO CASES OF STRICTURE OF THE RECTUM: EXTERNAL PROCTOTOMY.

BY WALTER B. PLATT, F.R.C.S. (ENG.),
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CASE I. *Syphilitic stricture of rectum; recto-vaginal fistula; external proctotomy; entire relief from difficulty of defecation.*—M. W., married, a small, thin, dark-complexioned woman, about thirty-five years of age. For three years patient had had difficulty and pain in defecation, with constipation; some blood passed at stool. She attributed her stricture to an operation for fistula in ano; no history of syphilis, or physical signs, except circular, pigmented spots on legs. The patient had, however, led an irregular life, and is now living with a negro. If no laxative was taken, bowels moved but once a week, and then with diarrhoea and pain. Apart from this she considered herself in fair health. Fluid fecal

¹ In Case III., the gurgling of blood in the lungs could be heard ten feet from the patient.

matter sometimes issued from vagina. She had a very lax anus, surrounded by a fringe of external piles, flat and bluish.

One and one-half inches up the rectum a great narrowing of the calibre of the bowel was felt, which barely admitted the tip of the forefinger. It appeared to be more in the superior part of the bowel. It was found, after the operation, to be three-fourths of an inch long, and somewhat longer on the inferior than on the upper surface. It was granular within, and very hard and inelastic to the touch. The stricture could be moved from side to side with the finger-tip.

After some weeks of anti-syphilitic and tonic treatment, the case was deemed eminently suitable for external proctotomy, which was accordingly done November 20, 1887. The patient being etherized, the skin and part of the adjacent tissues from the anus to the coccyx were divided with the thermocautery knife. Its use was so unsatisfactory that recourse was had to the knife to complete the operation. The skin, sphincter, lower rectum, and stricture being divided in the median line from above downward (the stricture by the introduction of a long stricture knife), the bowel above the stricture could be plainly felt—smooth, soft, elastic, and apparently not abnormally dilated. The hemorrhage was very free for a moment after the division of the rectum, and the blood was bright red in color. The flow was checked with little trouble by the free use of hot water and pressure with hot sponges. An oiled linen rag was introduced into the rectum, and filled with sponges, so as to exert pressure upon the rectal walls and the cut surfaces. One-fourth grain of morphia was given twice in the following twenty-four hours, and the sponges removed at the end of that time. There was considerable brownish discharge, and a little blood and pus escaped when the sponges and the oiled rag were removed. The wound was now thoroughly washed out twice daily with warm carbolized water, and iodoform dusted in as far as practicable; a pad of absorbent cotton applied over all.

December 9. Nineteen days after operation a Tiemann's soft-rubber conical rectal bougie (No. 6) was passed.

10th. No. 7 passed.

10th. Passed No. 10. I have five times passed No. 8 since last note. It gives the patient some pain to go about and uneasiness to sit down. Patient has a good stool every second or third day, after using licorice powder. She has control over flatus and feces, she looks well, and eats the same food as before the operation. Some time after this the patient was seen by my nurses going about the street. She said she was in good condition, and had one stool daily by smoking a cigarette. She did not consider a bougie any longer necessary, although she was advised to have it passed once a week.

CASE II. *Syphilitic stricture of the rectum: recto-vaginal fistula; external proctotomy; entire relief from symptoms.*—F. W., a slender, small, pale woman, æt. twenty-five, married. There was a clear history of infection nine years ago, when she had a sore

upon the vulva, followed by loss of hair, sore-throat, and a skin eruption. Soon after this a "wart" was removed from the perineum, and five months ago the writer removed abundant cauliflower-like growths from the labia-minora, perineum, and the circumference of the anus. Since last autumn, for about eight months, she had had difficulty in defecation, and fluid passages, two or three daily. Said she had rectal stricture and a fistula. She had palpable supratrochlear and inguinal glands. No evidence of skin eruption; remnants of the cauliflower-like eruption still visible on vulva. Rugæ in vagina greatly hypertrophied. A milky discharge from the vagina, and a small opening in the vaginal wall communicating with the rectum. Patient said that fluid feces sometimes exuded from the vagina in small quantity. Her husband had an abundant macular red eruption on his face.

About one and three-fourths inches up the rectum could be felt a very firm, slightly movable ring, barely admitting the tip of the finger. This was apparently one-half an inch in thickness. Operation June 18, 1888. The patient being etherized, a long probe-pointed bistoury was introduced into and through the stricture, the cutting-edge directed downward in the median plane. The stricture was now divided entirely through until the smooth, thin, soft, lower surface of the rectum above the stricture could be felt. The incision was then completed by dividing all the tissues of the rectum, sphincter, and skin down to the sacrum and coccyx. Hemorrhage was moderate and easily controlled by hot water irrigation. The knees were tied together, iodoform dusted over the region, and a pad of absorbent cotton firmly applied to the seat of operation by a "T" bandage.

Beyond a copious discharge of brownish, bloody fluid from the rectum for the first two days, convalescence was uninterrupted. The rectum was washed out with carbolized water twice daily, and after thoroughly drying the parts, a dusting powder applied. Very little pain was experienced after operation; patient complained merely of parts feeling very sore when irrigated. After three to four days, yellow discharge abundant. Passage of rectal bougie No. 6 begun on the eighth day; patient kept for a week on milk diet.

She was up and about the room in ten days. Went about as usual shortly after this. October 1, a No. 8 rectal bougie was passed twice for one week at the end of ten days, then once a week up to the present time. The patient was placed upon a treatment of biniodide of mercury before and after the operation, with moderate improvement. There was a return of syphilitic symptoms, enlarged sub-occipital and sublingual glands. These quickly disappeared after two weeks' use of twenty-five grains of potassium iodide three times a day, with hyd. cum creta and Dover's powder, one grain of each five times daily. A tonic treatment has been employed from time to time. Up to November 1st I introduced a No. 8 conical rubber elastic bougie, once a week with little difficulty. Some bronzing of skin about the anus from discharge and daily washing out with solution of carbolic acid. Patient has one comfortable stool daily. Perfect control of feces and

flatus as far as I can determine. Feels well and goes about as usual. With the exception of being pale she is in good physical condition. A pink, granulating slit, still open, extends from anus nearly to coccyx. This gives rise to no pain or discomfort. There is still a slight discharge.

REMARKS.—Both the above patients have expressed themselves as greatly relieved, and at the present time, one year and five months, respectively, from the time of operation, have excellent control of both flatus and feces, experience no discomfort, and almost no inconvenience. They are now going about and attend to their daily occupations. Like all known operations of any kind for strictures of flexible canals lined with mucous membrane, we look for palliation, not cure. A bougie must be passed once a week at least for the remainder of the patient's life.

With electrolysis I have had no experience. Whatever this procedure may do for soft and short strictures, the writer must confess himself sceptical regarding any benefit to be derived where the stricture is long and dense, as in the above cases.

External proctotomy was probably first advocated and extensively practised by Nélaton and Humphrey, who operated with the knife. It has since been practised principally by French surgeons; among them Verneuil, Fochier, Labba, Trelat, Panas; and by Kelsey and others in America. The operation was done at first by Nélaton with the knife; later surgeons have often used the thermo-cautery and *écraseur*, sometimes the galvano-cautery. The choice of an instrument may depend somewhat upon the cause of the stricture. If due to malignant disease, the thermo-cautery ought to be used to divide the stricture, if not anus as well. Or if for any reason hemorrhage is particularly expected, either the latter instrument, the galvano-cautery, or the *écraseur*. Otherwise I prefer the median downward incision with the long, straight, probe-pointed, strong bistoury.

The hemorrhage was not excessive in either of the two cases operated on by the writer, easily controlled by hot water, and in one case by an oiled rag packed inside with sponges. Previous to operation the rectum ought to be thoroughly emptied as far as possible, by giving a dose of castor oil the night before, and an enema on the day of the operation. After etherization the anus should be dilated by the thumbs of the operator, taking plenty of time to do it, dilating gradually but thoroughly. This adds both to the comfort of the patient and to the convenience of the surgeon. The after-treatment consists of rest in bed with the knees fastened together for the first twenty-four hours, a pad being interposed to prevent discomfort. Milk diet for ten days, and enough opium for forty-eight hours to insure quiet. The wound ought to be washed out twice daily with warm carbolyzed water, and

after thoroughly drying the parts, apply iodoform to the wound, and some soothing dusting powder to the surrounding skin. To cut a rectum and anus for the lower two to three inches of its extent, down to the sacrum and coccyx, seems not only radical, but barbarous. We must not forget that we leave the patient with a granulating V-shaped slit for a long time after the operation, if not forever, instead of the previously circular and puckered anus; but any patient who has long suffered the miseries of rectal obstruction will thank the surgeon for the great relief he has afforded. Moreover, this operation will render that of artificial anus in the flank much less frequent, and is infinitely better in its results when it can be done in place of it.

The reason why we divide everything down to the bone and outward through the anus, is to solve the vital matter of drainage. Without this complete incision the lower rectum becomes a bowl of poison, which experience shows the system is likely to absorb with resulting septic intoxication and often death. With the incision, the operation is free, safe, and good in its results. The insertion of a drainage tube between the anus and coccyx, leaving the anus intact, would not solve the septic difficulty entirely, while it would leave a fistula to be operated on later by cutting through into the rectum.

I wish to acknowledge the kind assistance of Dr. S. T. Earle, who took charge of the second case after the first ten days.

859 PARK AVENUE, BALTIMORE,
November 19, 1888.

ON LESIONS OF THE CONUS MEDULLARIS AND CAUDA EQUINA, AND ON THE SITUATION OF THE ANO-VESICAL CENTRE IN MAN.¹

BY WILLIAM OSLER, M.D.,
PROFESSOR OF CLINICAL MEDICINE IN THE UNIVERSITY OF PENNSYLVANIA.

THERE have been published recently several observations which add materially to our knowledge of injuries and lesions of the terminal section of the spinal cord and of its nerve roots, and which also throw considerable light on the exact situation of the ano-vesical centre.

In a suggestive and valuable communication "On the Segmental Distribution of Sensory Disorders," Ross² analyzes the distribution of the sensory branches of the lumbo-sacral plexus, and calls attention to the arrangement of the lower sacral and coccygeal nerves, which supply by the small sciatic, derived from the third and fourth sacral roots, the external aspect of the skin on the back of the thigh, and from these same roots, through the inferior hemorrhoidal, pudendal, and pudic nerves, the anus, perineum, scrotum, and penis.

¹ Read before the Philadelphia Neurological Society, October 22, 1888.

² Brain, January, 1888.

Cases of injury have been reported in which a sensory paralysis of this distribution has been associated with paralysis of the rectum and bladder, and with little or no involvement of the parts supplied by the first and second sacral and the lumbar nerves. Such instances are, in fact, important and valuable experiments from the study of which much may be gathered. Thorburn¹ reports four cases of injury of the cauda equina in which, with paralytic symptoms of variable extent, there were incontinence of urine and of feces, and anæsthesia in the distribution of the branches of the lower sacral nerves. He quotes also a case of Olivier's of gunshot wound in the lumbar region, which nine years after the accident presented complete anæsthesia of the postero-internal and anterior parts of the thighs and of the penis and scrotum.

Bernhardt² records a case of injury, the result of a fall on the buttocks from a height, which was followed by retention of urine and incontinence of feces. There was no paralysis of the legs, but there was absolute anæsthesia of the anus, perineum, scrotum, penis, and the skin of the upper two-thirds of the thighs. There were erections and within a few weeks after the injury coitus was possible, but ejaculation was defective and the semen flowed slowly *post cohabitationem*. Although the scrotum was anæsthetic, the testes were sensitive to pressure, and the cremasteric reflex was present. These parts are supplied from the genito-crural nerve, a branch of the lumbar plexus, which is, as Thorburn points out, usually unaffected in these cases.

A still more instructive case is reported by Oppenheim in the last number of the *Archiv f. Psychiatrie*, Bd. xx. Heft 1. A workman fell from a height of nineteen feet upon his sacrum. There were numb feelings in the legs, paralysis of the bladder and rectum, and complete anæsthesia of anus, perineum, scrotum, penis, and of the skin on the postero-internal aspects of the thighs. No erections. The reflexes were retained. The movements of the legs were perfect and the numb feelings disappeared. The other symptoms persisted and death took place about three and a half months after the injury. The autopsy showed a fracture of the first lumbar vertebra, and a traumatic myelitis and hæmatomyelitis of the conus medullaris, and a degeneration of the posterior roots of the third and fourth sacral nerves coming from the conus at the seat of injury. We have here the very anatomical facts needed to complete the picture, and they moreover render it very probable that in these cases the terminal portion of the cord—the conus—is itself the seat of the lesion, although it is possible that involvement of the nerves alone would produce the symptoms.

By no means the least interesting aspect of these cases is the light they throw on the situation of the ano-vesical centre in man. Kirchoff¹ had already concluded that it was situated in the conus medullaris in the region of exit of the third and fourth sacral nerves. In the case of a man who had fallen on the nates, and whose important symptom was paralysis of the bladder and rectum, the lesion was found in the conus three centimetres above the filum terminale. Oppenheim's case is a still more accurate demonstration.

The following case can be understood with the aid of the preceding remarks:

Joc. C. H., æt. sixty-three, applied at the Infirmary for Nervous Diseases March 7, 1888. Family history good. Has always been healthy and well, though as a young man he had syphilis. Served in the army and on June 8, 1862, sustained a fracture of the spine. In the battle of Cross Keys, as he was crossing a bridge, a bullet struck him on the cartridge-belt, and the shock knocked him off the bridge, and he fell on the rocks in a sitting posture. He was senseless, and on coming to found himself in the ambulance wagon. Was in the military hospitals three and a half years at Winchester and Fort McHenry, for three years of which time he was on a water-bed. The skin of the back was not broken by the fall. He was paralyzed in the legs and lost control of the bladder and rectum. After a time he could move the legs, but he did not walk until December, 1865. Since that time he has been able to be about, but he has never regained control over the bladder and rectum. Uses a catheter three or four times a day. Never knows when he is going to have a stool.

Present Condition.—Well-built, vigorous-looking man for his age; walks well, but favors the left side a little. When stripped, it is seen that the left leg is slightly smaller than the right. Measurements gave, right calf fifteen inches, left thirteen and a quarter inches; left thigh also somewhat smaller. He says the leg has been thin ever since the accident, but he is always able to get about quite well. The spine is straight, the lower dorsal vertebrae a little prominent, lumbar normal; no signs of abrasion or of any scars; no pain on pressure.

There is complete anæsthesia of the lower gluteal regions, posterior aspects of the thighs, perineum, scrotum, and penis as far as its root. In all other regions sensation is perfect. He does not feel the passage of a catheter. He is impotent. No information asked about seminal emissions.

Gluteal reflex well marked.

Cremasteric reflex present.

K.-J. + +. No ankle clonus.

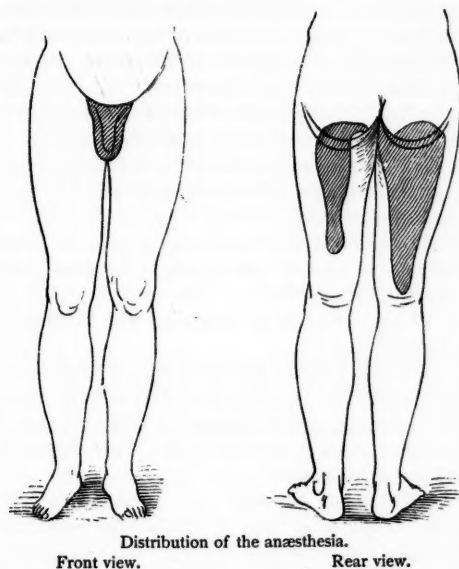
We have to deal here with a residual paralysis of the bladder and rectum and of the skin supplied by the small sciatic, inferior hemorrhoidal, pudendal nerves arising from the third and fourth sacral roots. Whether the injury involved originally the cord or

¹ Brain, January, 1888.

² Bernhardt: Berliner klin. Wochenschrift, No. 32, 1888.

¹ Archiv f. Psychiatrie, Bd. xv.

only the branches of the cauda equina does not seem possible to determine. The fact that slight wasting of one leg remains would indicate a neural rather than a central lesion.



Distribution of the anæsthesia.
Front view. Rear view.

These cases do not all result from injury. Rosenthal¹ reports the case of a woman, aged thirty, who, as the result of exposure to cold, had incontinence of urine and feces, associated with anæsthesia of anus, perineum, vulva, vagina, and lower gluteal regions. The legs were in all relations normal. From a consideration of these cases we may conclude:

1. That the ano-vesical centre in man is situated in the lowest segment of the spinal cord—the *conus medullaris*—at the region of exit of the third and fourth sacral nerves.

2. The association of paralysis of the rectum and bladder with anæsthesia in the distribution of the inferior hemorrhoidal and pudendal nerves points to a lesion of the lower sacral nerves or of the *conus medullaris*. It is not always possible to determine which is affected.

REPORT OF A CASE OF INTESTINAL OBSTRUCTION FROM EPITHELIOMA OF THE DESCENDING COLON.

Resection of Intestine; Subsequent Closure of Artificial Anus.

By CHARLES B. PENROSE, M.D., Ph.D.,
OF PHILADELPHIA.

B. P., aged fifty-three, had been suffering with obstinate constipation for twelve months. Defecation had gradually been becoming more difficult and

painful. There had been no movement of the bowel for twenty-eight days before operation, though purgative medicines and rectal injections had been vigorously administered. Before the abdominal distention became too great, her attending physician, Dr. Bernardy, had observed a movable mass in the left iliac region, which he had diagnosticated to be cancer of the descending colon. There had been feculent vomiting for two days before the operation.

When seen by the writer, on February 1, 1888, the abdomen was greatly distended. There were constant abdominal pain and dyspnea. Temperature 101°; pulse 130. Tongue dry and brown. There was no doubt about the diagnosis of intestinal obstruction—probably from cancer of the large intestine—and laparotomy was immediately performed. The incision extended from the umbilicus to four inches below. The intestines were congested, and there was a small quantity of bloody serum in the peritoneum.

As the distended intestines greatly impeded the search for the obstruction, a loop of bowel was incised, and the flatus and fluid feces allowed to escape. The opening was closed with a continued silk suture (Dupuytren's). A hard mass was felt lying deep in the abdomen, to the right of the vertebral column. This proved to be a dense, hard, annular constriction, about one inch in width, around the descending colon. The gentle traction used in bringing the constricted intestine to the abdominal opening was sufficient to break it transversely across—through the middle of the stricture. As, however, the growth involved the whole lumen of the bowel, each end remained closed, and no feces escaped.

The transverse section of the stricture presented the appearance of friable colloid material. The mesentery of the constricted portion of the intestine was thickened, indurated, and contracted. No indurated glands were discovered.

The stricture, with about ten inches of the contiguous thickened portion of intestine, and a triangular piece of mesentery, was excised. It was necessary to ligate many vessels in the divided mesentery. The upper end of the bowel was turned over the parietes, and a large quantity of flatus and a bucketful of green fluid feces escaped.

The two ends of the divided gut were stitched together for one-half their circumference, with a continuous strong silk suture, which penetrated all the intestinal coats. The ends were then stitched, at the lower angle of the abdominal incision, to the skin margin, by a similar continuous suture. The abdominal cavity was irrigated with warm distilled water, and the incision closed. No pus escaped into the peritoneum during the operation.

For thirty-six hours after the operation there was a continuous discharge of flatus and feces from the abdomen. The distention disappeared very rapidly, and in twenty-four hours the abdominal parietes were depressed below the costal margin. The relief to the patient was so immediate that she slept almost continuously for the first two days.

With the exception of an attack of pneumonia in the fourth week, the convalescence was uninterrupted. Examination of the excised bowel showed that the

¹ Ueber das centrum Ano-vesicale, Wiener med. Presse, Nos. 18, 19, and 20, 1888.

growth was epithelioma, involving the portion of the large intestine about ten inches from the anus.

The patient continued well, and had regular evacuations daily, about eight o'clock every morning, from the artificial anus. The opening contracted in size, so that three months after the operation it would admit but two fingers. The skin and mucous membrane at no time presented an abraded, ulcerated, or unhealthy appearance. There was at times a slight prolapse of the bowel through the opening.

On May 23, 1888, she was etherized, and Dupuytren's enterotome was placed on the septum between the two sections of gut. The enterotome came away at the end of seven days, and the bowels were moved by the natural anus. After this the bowels were moved daily, partly by the natural and partly by the artificial anus.

As a considerable spur still remained between the upper and lower segments of gut, and the feces had to pass over this to enter the rectum, Dupuytren's enterotome was again applied on June 24, 1888, and the spur was divided to the extent of about one and a half inches. The enterotome came away in seven days, and the bowels were moved for two weeks chiefly by the natural anus. Feces then began to come, in gradually increasing quantity, through the abdominal opening. A piece of heavy rubber catheter, six inches in length, was placed in the bowel, extending from the upper to the lower portions, in order to depress the remnant of the spur. This was used for six weeks. It was necessary to reintroduce it every two or three days, as it was frequently passed out by the natural anus. Its presence increased the relative amount of feces passed by the natural way, though about one-half the total quantity continued to escape by the abdominal opening.

On August 20, 1888, the patient was again etherized. The edges of the artificial anus were freshened by removing a circular strip of skin about a third of an inch in width, and a contiguous circular strip of mucous membrane about half an inch in width. An elliptical disk of rubber one-sixteenth of an inch in thickness, and with a long axis of one and a half inches, was armed with four silk ligatures placed symmetrically around its edges, and was introduced into the artificial anus on the plane of the parietal peritoneum—thus forming a floor for the abdominal opening, and protecting the intra-abdominal line of incision from feces and flatus. The four silk ligatures were passed through the parietes, in order to hold the rubber disk in place. The freshened edges of the artificial anus were united by sutures of silk-worm-gut. A rectal tube was used continuously for the first two days. The bowels were moved by enema and sulphate of magnesia on the fourth day. The sutures were removed on the tenth day, and the silk ligatures attached to the rubber disk were cut. On the fifteenth day an abscess about the size of a pea ruptured at the lower angle of the abdominal wound, and for a few days a very small quantity of feculent material escaped. The rubber disk was discharged from the rectum about the sixteenth day.

When last seen, November 15, 1888, this woman was at work; her bowels were moved easily and naturally, and the abdominal line of incision was

closed throughout, presenting the appearance of the incision of a simple laparotomy.

One of the chief points of surgical interest illustrated by this case is the advantage of making a temporary artificial anus after resection of the intestine, when there is a great collection of flatus and feces in the alimentary tract, rather than by uniting the gut by circular suture, and immediately restoring its continuity. The dangers incident to immediate suture are due to the following causes:

1. The sutures are introduced in an intestinal wall which has become weakened and attenuated by prolonged distention.

2. The line of suture is exposed to great tension, which in some cases of obstruction has been sufficient to rupture the intestine.

3. There is danger of sloughing and kinking at the suture line.

4. The relief to the patient is not so immediate, since the flatus and feces have to travel a longer road before escaping, and the danger of toxæmia, and of subsequent obstruction from kinking and intestinal paralysis, is increased.

Von Bergmann (*Deutsch. med. Wochenschrift*, No. 24, 1888) reports a case in which, after resection, the continuity of the intestinal tract was immediately restored by a circular intestinal suture, and on the second day it was necessary to reopen the abdomen, remove the intestinal sutures, and make an artificial anus.

Agnew (*Med. and Surg. Reporter*, September 15, 1888) reports a case of resection of the small intestine in which the continuity of the gut was immediately restored, and the subsequent autopsy showed that one of the stitches had been torn out, though there had been no escape of feces. And he adds:

"With the light daily accumulating in this department of surgery, it would have been better, instead of stitching together the ends of the intestine, to have brought them out of the external wound, and to have attached the half circumference of each to the parietes, preparatory to another and a later operation for reestablishing the continuity of the intestinal tract."

A SUCCESSFUL LAPAROTOMY FOR STAB-WOUND OF THE INTESTINE.¹

By J. C. SEXTON, M.D.,
OF RUSHVILLE, INDIANA.

IN presenting this report, the writer does not feel that he is called upon to do more than direct attention to certain points in connection with the operation and subsequent treatment. "Rule of action" has already been formulated for the treatment of such cases to such an extent that further comment thereon is uncalled for, unless something distinctive is done or observed during the course of an individual case.

¹ Read before the Union District Medical Association.

While I will not use valuable time in reviewing the literature of the subject, I will make the statement that the number of cases successfully operated upon is now so large as to warrant interference in every one of these necessarily fatal cases. A large quantity of intestinal contents poured out into the abdominal cavity, and an external opening of only half an inch whereby it could escape, is quite as surely, though not so quickly, fatal as a stab in the heart itself.

If called to such a case, no surgeon should hesitate to operate even in the face of shock of quite considerable degree, provided he can surround himself with antiseptic advantages, and prepare his operating-room so that he can properly protect the exposed viscera.

The following case is offered in support of this position:

M. L., aged twenty-nine, received a stab-wound of the abdomen and immediately presented himself at the office of Dr. J. W. Rayburn, of Andersonville, Indiana. He was in great pain and very weak. Dr. Rayburn found a half inch opening in the right iliac region through which a knuckle of intestine was protruding. After cleansing the gut in a warm alcoholic solution he was able to return, after gentle manipulation, what appeared to be an uninjured intestine to the abdominal cavity, when, to his surprise, intestinal contents began welling up from the bottom of the wound. He applied a dressing of borated cotton, gave a grain of opium, and had the patient conveyed a short distance to the house of a relative.

I was called to his aid and arrived at the house at midnight, July 14th, three hours after the injury. The patient was a man of perfect physique, absolutely temperate, and up to the moment of injury in perfect health. He was very restless, and suffered from intense thirst and severe pain.

An examination, made under careful antiseptic precaution, disclosed an opening in the abdomen half an inch long, located two inches inward from the right superior iliac spine and half an inch below the level of that process, through which intestinal contents were oozing.

Diagnosis.—Stab-wound of the intestine. The patient decided to take the chance of an operation, and we began our preparations. We waited until daylight, and also availed ourselves of the valuable assistance of Dr. C. H. Parsons, of Rushville.

Nine hours after the injury the patient was placed on the operating-table in fair condition. All antiseptic precautions that were possible had been taken. The room had been cleaned. All the water to be used in the operation had been boiled. The dressings, instruments, sponges, etc., had been thoroughly disinfected. Patient was in front of an east window through which the sun was reflected quite hot. He was covered with clean warm blankets, and hot applications made to feet, thighs, and armpits.

The original wound was enlarged to five inches, and twelve inches of intestine turned out. This was emptied of its contents through two large perfora-

tions, and enveloped in napkins wrung out of hot 1 : 20,000 bichloride solution. The abdominal cavity was then emptied of more than a teacupful of intestinal contents. No other intestinal injury was detected and the perforations were closed with a single line of interrupted Lembert sutures of sublimated silk. The larger perforation was squarely transverse and divided the intestinal wall from the mesenteric attachment to the periphery. The smaller was about three-fourths of an inch long, somewhat diagonal, situated quite two inches from the other, and both on the same wall of intestine. The abdominal cavity was then flushed. Pitcherful after pitcherful of hot 1 : 20,000 sublimate solution was poured in until the water returned perfectly clear. The cavity was then mopped dry and the intestine returned. A rubber drainage tube was carried to the bottom of the pelvis. The peritoneum was closed with catgut and the abdominal wall with an alternate layer of deep and superficial sutures. The external dressing was of carbolized gauze, iodoform, and borated cotton.

He had a rise of temperature soon after the operation, but this subsided as soon as he became quiet. He was given a half a grain of morphia, with $\frac{1}{16}$ gr. atropia, forty minutes after the operation, but the drug was not again used. Tympanites, tenderness, and nausea came on promptly, so that we began the use of seidlitz powders in fifteen hours after the operation, giving from a third to half a powder every three hours.

July 16. Twenty-four hours after the operation: temperature $97\frac{3}{4}$; respiration 22; pulse 92. Tympanites and tenderness much less. Nausea persistent.

17th. Fifty hours after the operation: pulse 92; respiration 22; temperature normal. No pain, slight tympanites, tenderness nil. Nausea distressing, some vomiting. Wound looking well. He was given a quarter of a grain of calomel every two hours. This treatment stopped the vomiting. Nausea unrelieved.

18th. Pulse and temperature normal. Nausea unrelenting, can take no nourishment on account of it. Seidlitz powders, one-third part every three hours, and enema to obtain motion of bowels.

19th. General condition good. Takes a little milk.

20th. Three actions of bowel remove the swelling, tenderness, and nausea. Appetite returns. Patient calls attention to the fact that borborygmus does not hurt him, but makes him feel better for a time. Drainage tube removed. Stitches showing signs of cutting. Removed all of them and allowed the wound to open. Peritoneum united. Wound dusted with iodoform and packed from the bottom with borated cotton. Edges drawn up with plasters.

No further interest attaches to this now established convalescence. During the second week, however, his bowels were not moved for four days, when the tympanites and nausea came back, he lost his appetite, became depressed, had a rise of temperature, and pain in the bowels. These symptoms all disappeared at once, after free evacuation of the bowel was obtained.

The abdominal wound united by granulation. He went on to a perfect recovery, and was discharged at the end of the third week. The after-treatment of this case was wholly in the care of my colleague, Dr. Rayburn, and to his skill and personal attention I am greatly indebted.

An unlooked-for complication attaches still further interest to this case. On the eighty-eighth day (October 10, 1888) after the operation described above, this man was again injured by the bursting of a cannon which he was firing. He had so far recovered that he was able to do ordinary work, and, although cautioned by his medical attendants that the cicatrix was yet young and soft, he made no effort to protect himself against a ventral hernia.

He was holding the touch-rod, and fired the gun, when he was knocked down by a flying fragment. He was injured about the breast; sustained a fracture of the radius. He had several cuts and bruises about the body and face, and was struck in the right groin with sufficient force to open the old wound.

I arrived at the house five hours after the accident. Patient unconscious, very restless, badly shocked, and bleeding quite freely from some lacerations of the omentum. A large loop of intestine, with a portion of omentum, had escaped, and became strangulated to such an extent that Dr. Rayburn had been unable to reduce it by manipulation.

After stimulating the patient with atropia, brandy, and hot water, and flushing the abdominal cavity with hot 1 : 20,000 bichloride solution, he rallied sufficiently to be placed under an anæsthetic.

I enlarged the wound, amputated the lacerated omentum, and returned the bowel, after a hasty but fruitless search for the intestinal suture of the first operation. The abdomen was carefully sponged out, and a rubber drain carried into the cavity. The peritoneum was then closed with carbolized catgut. The old cicatrix was then dissected out, and the edges of the wound brought accurately together with heavy silk. This adjustment was reinforced by spreading over the abdomen and hip on either side of the wound a broad piece of heavy rubber plaster. The edges of this were placed one and a half inches apart, then by fastening hooks and eyes on its edges, it could be laced up so that all strain was taken off the stitches, and at the same time there was no interference with the absorbent and antiseptic dressing.

The patient rallied promptly. Under Dr. Rayburn's excellent management he escaped a second time the dreaded peritonitis, and made an uninterrupted recovery. Union by first intention took place, and no pus formed. He was able to walk to the polls and cast his vote on the twenty-seventh day after his second injury.

Concerning the intestinal suture, the fact pointed out by Halstead (*The American Journal of the Medical Sciences*, 1887), that the submucosa is the strongest part of the intestinal wall, is most valuable. The operator readily detects this point of greatest resistance, and feels that a suture passed into it will

be secure. Many prefer a continuous suture in adjusting a rent of the intestine, because it is more rapid. With the interrupted sutures, however, the adjustment is more accurate, and, if the silk is fine enough, the knot will not retard the union, but can slough off into the lumen of the bowel more rapidly than the unbroken thread.

Flushing the abdominal cavity for cleansing purposes, or where peritonitis has already begun, has been spoken of so frequently that I need not mention it further in this connection. Flushing with hot solutions or simple water, for the purpose of overcoming shock, has not received the attention its utility deserves. Only one writer, so far as I am aware, has called attention to it up to this time. It is rapidly and easily done, and in our case had a prompt effect both times it was tried. The pulse became firmer, fuller, stronger, while the respirations and the color of the skin at once improved.

I find no record of a case in which the solicitation of peristalsis was begun so early after operation for intestinal perforation. The prompt relief afforded by this measure is very satisfactory. To see tympanites that threatens to tear out the sutures, that is giving pain, causing restlessness, nausea, and general distress, disappear in a few hours, and the patient become both calm and cheerful, will at once convince the most sceptical of the utility of this treatment.

The older method of locking up the bowel is just exactly what ought not to be done in such a case. One does not want adhesions, he wants to prevent them. Here is a proposition that I hold almost self-evident, viz., vermicular motion of the intestine is vastly less straining upon the intestinal sutures, than distention by accumulated flatus.

It may not be presumption in me to repeat the injunction so strongly insisted upon by others, that the administration of opiates is wrong in such a condition, when other means will not only relieve pain but overcome the cause of it.

This case adds but little to what as already been presented to the profession. Yet, coming, as it does, from a point far remote from the centres of surgical triumphs and advancement, it does tend to prove that *any one* possessed of ordinary skill, who will surround himself with proper antiseptic care and preparation, may reasonably expect success to crown his work.

MEDICAL PROGRESS.

Treatment of Spinal Atrophy in Germany.—Therapeutic intervention in spinal atrophy, according to DR. GRAUPNER (*Der Fortschritt*, July 20, 1888), will favor remission in the progress, but will not cure the disease.

As a rule, he begins treatment with inunctions of mercury, starting with one drachm of the blue ointment, the dose of which is increased daily till it reaches two

and a half drachms. At this point the mercurial inunctions cease, and treatment is continued with the daily administration of seventy-five grains of iodide of potassium in three divided doses. Dr. Graupner gives the following formula for a solution of iodide of potassium, to which he adds some belladonna as an antidote to the iodide.

R.—Iodide of potassium . . .	75 grains.
Ext. of belladonna . . .	7½ "
Distilled water . . .	1½ pints.

The iodide of potassium can be replaced by the iodide of sodium, even if the tabes be not of syphilitic origin.

The treatment with nitrate of silver has in Germany, as elsewhere, its adherents and opponents; it consists in taking three times daily one of the following pills:

R.—Nitrate of silver . . .	4¼ grains.
Terra alba . . .	q. s.—M.

Make into thirty pills.

Dr. Graupner also prescribes antipyrin in thirty grain doses three times daily, in preference to antifebrin, which is given in seven grain doses, or else he uses intracutaneous injections of the first.

To overcome the motor-incoördinations Dr. Ewald uses injections of physostigma.

R.—Salicylate of physostigma . . .	¼ grain.
Water . . .	2½ drachm.

One-half of the contents of a Pravaz syringe would be the ordinary dose for an injection, but it has a drawback, which is, that it at times provokes vertigo and vomiting.

In treating the torpid forms, recourse is had to hydrotherapeutics. Salt, sulphur, and bran baths are used; to the latter are added from one to three ounces of sulphate of potassium or sulphate of sodium, with one ounce of vinegar. With this are combined vertebral inunctions of balsam of musk, camphorette alcohol, or some other exciting stimulant. Further, the continuous and interrupted currents are used. Add to this a strict diet, with moderate physical exercise, and the treatment is complete.—*Revue gén. de Clinique et de thérapeutique*, November 8, 1888.

Novel Curative and Prophylactic Treatment of Asiatic Cholera.—Under the above title, DR. A. TRAST sums up his views as follows:

1. In order that the treatment of Asiatic cholera should be complete and rational, it must be divided into (a) curative treatment, and (b) prophylactic treatment; the curative treatment comprising the treatment of the symptoms and the pathological conditions.

2. The symptomatic treatment, which comprises the treatment of symptoms, he does not consider in this article.

3. The pathological treatment, which really is the principal factor of this treatment, refers to the cause of the affection itself. The treatment must consist, theoretically speaking, in the administration of a microbe-destroying agent powerful enough to destroy pathological microbes situated in the most remote parts of the human economy.

4. From a practical as well as a clinical standpoint the bichloride of mercury, dissolved in the form of a liquor, similar to that prepared by Dr. Van Swieten, would seem to answer all requirements.

5. Further, still, if this chemical agent is taken inwardly, before the comma bacillus has been absorbed, it will act as a prophylactic against cholera, in preventing all possible growth of the cholera bacillus within the human body.

6. Bichloride of mercury can thus be justly called the "chemical vaccine of cholera."

7. During an epidemic one can obtain immunity from cholera by using hypodermatic injections of powdered calomel, or the yellow oxide of mercury, which being slowly transformed into the bichloride, would guard the body against infection for a considerable length of time.—*Gazette Hebdomadaire de méd. et de Chirurgie*, November 16, 1888.

Operation for a New Bladder.—PROFESSOR TIZZONI and DR. POGGI, of Bologna, have devised and carried out an extremely ingenious operation for the purpose of "restoring" the bladder in cases in which it is partially destroyed by disease. The object of the operative procedure is to replace the bladder by means of a substitute, that substitute being a portion of intestine. The operation (on an animal) was performed in two stages, an interval of about a month elapsing between them. The first part of the operation consisted in the cutting out of a portion of the intestine, the two ends from which it was taken being immediately sutured; the mesentery was left attached to the excised portion. The ends of this portion were then closed so as to form a sac; one end was then brought down and fixed to the neck of the bladder. The second portion of the operation consisted in separating the ureters from the bladder, excising the latter organ, suturing the intestinal sac in the position of the bladder, and grafting the ureters on to its posterior wall. For a few days there was incontinence of urine, but after a fortnight the sphincter regained its power, and the animal recovered completely. In consequence, however, of the small size of the new bladder, micturition was necessarily very frequent. Professor Tizzoni and Dr. Poggi propose to repeat this operation on another animal, taking care to excise a larger portion of intestine, so as to imitate more nearly the normal capacity of the bladder.—*Lancet*, November 10, 1888.

Action of Alcohol upon Pepsin.—DR. BARDOT (*Les nouvelles remèdes*, June 8, 1888), having made several experiments to determine the solvency of pepsin in the presence of alcohol, arrives at the following conclusions:

1. A moderate quantity of alcohol does not alter the fermentative nor the digestive power of pepsin.

2. Should the amount of alcohol exceed fifty per cent., the digestive power of pepsin is at first slowed, then gradually destroyed.

3. Wines containing large quantities of tannin are detrimental to the action of pepsin; small quantities of tannin have no action whatsoever.

The Influence of Moderate Exercise upon Digestion.—DR. COHN (*Archiv für klin. medicin*), in order to decide the question: "Is rest or exercise necessary to favor digestion?" made the following experiments in the laboratory of Professor Rossback:

He gave to a number of dogs scraped meat and water; after the lapse of a certain time the contents of the stomach

were removed, the dogs having been submitted to exercise as well as to rest.

With the dogs which had rested, digestion was at its highest one hour after the meal; the juices of the stomach were rich in hydrochloric acid and pepsin, and poor in lactic acid; at the end of two hours digestion was still further advanced; the quantity of hydrochloric acid and peptones considerable; of lactic acid only traces being found. At the end of six hours digestion was complete.

In the dogs which had been submitted to two hours' active exercise after their meal, traces only of hydrochloric acid and peptones were found, but large quantities of lactic acid. It was only after the lapse of five hours (the animals having rested for three hours) that digestion began, marked by the presence of large quantities of hydrochloric acid and peptones. At the end of six hours digestion was not yet completed.

EWALD and BOAS made the same experiments with the same results. Hydrochloric acid is a product of secretion; lactic acid one of fermentation; the slower the flow of the first, the slower digestion and *vice versa*. The writer concludes that exercise after a meal retards digestion.—*L'Abeille Médicale*, Nov. 19, 1888.

Painless Injections of Antipyrin.—DR. HAMON DE FOUNGERAY gives, in the *Gazette des Hôpitaux*, his method of rendering the hypodermatic injections of antipyrin painless, which is as follows:

Fill the hypodermatic syringe with the following solution:

R.—Antipyrin 5½ grs.
Sol. cocaine 10 per cent. 10 drops.

Insert the syringe deep into the soft tissue, inject and no pain will be felt.—*Gazette Hebdomadaire des Sciences Médicales*, November 3, 1888.

Lipian a Substitute for Cod-liver Oil.—DR. O. HAUSER reports, *Zeitschr. f. klin. Med.*, the results obtained with lipianus at the clinic of Prof. Kohls, at Strassbourg. The preparation was administered to thirty-eight children, ranging in age from fifteen months to thirteen and a half years. In every instance it proved itself to be equal, if not, superior to the ordinary yellow cod-liver oil. Amongst the different affections in which it was tried were rachitis, anæmia, scrofulosis, tuberculosis, and convalescence from severe illness. In every instance the little patients took the preparation with great relish; digestive disturbances, which are observed when giving cod-liver oil, were absent. Even during summer lipian was well borne. In all cases in which an increase in body-weight was expected, the same was fully realized. Lipian is given in the same doses as cod-liver oil, and can be mixed with other drugs, such as creasote, menthol, phosphorus, etc.—*Wiener med. Presse*, November 4, 1888.

Treatment of Affections of the Respiratory Organs with Rectal Injections of Carbonic Acid.—DR. LECOMTE having tried rectal injections of carbonic acid gas upon patients suffering with pulmonary tuberculosis, asthma, emphysema, and chronic bronchitis, states that he obtained satisfactory results, such as marked diminution of cough and expectoration, and alleviation of the dyspnoea, especially in asthma.

The mixture of carbonic acid and sulphuretted hydrogen seemed to him to produce the best results. The use

of eucalyptol and sulpho-carbonated water was followed by irritation, and a return of all the bad symptoms. After a certain period, the improvement at first obtained through the injections of carbonic acid ceases, even though the amount of this gas be increased.—*Gazette Méd. de Paris*, November 10, 1888.

Treatment of Diphtheria by Eucalyptus.—DR. MARRAY GIBBES, a physician of New Zealand, reports a series of remarkable successes obtained with eucalyptus in the treatment of diphtheria. The results noted from this treatment were:

1st. A prevention of the multiplication of the micro-organisms. The oil of eucalyptus (*oleum eucalyptus globulus*) introduced into the economy, through the medium of air, vapor, or food, reappeared in the secreting glands of the pharynx. Through its internal action it prevents the subsequent formation of false membranes. In none of the cases treated with this remedy was any paralysis observed.

2d. Prevention of putrefaction of the destroyed tissue, before its separation from the healthy tissue below. While under the influence of this remedy, the false membrane was always of a healthy color, and the breath remained sweet throughout the entire treatment.

3d. The external application of a moist and warm cataplasm aids the separation of the membranes. The vapors of the oil of eucalyptus will destroy microorganisms floating in the air. To obtain the best results, place some leaves of the eucalyptus tree (which contain the oil) in a dish of boiling water, near the patient, who should be covered with a tent.—*Revue de Thérapeutique*, Nov. 15, 1888.

Pomade for Eczema.

Resorcin 15 to 30 grs.
Yellow vaseline 1 oz.

This pomade to be used in eczema of the hands; it calms the itch and hastens the infiltration of the skin.—*L'Union Médicale*, Nov. 13, 1888.

Subcutaneous Injections of Solution of Chloride of Sodium in Cholera Infantum.—At a meeting of the Berlin Medical Society of Nov. 7, PROF. HENOCHE stated that he had obtained excellent results by treating cases of cholera infantum with subcutaneous injections of solutions of common cooking salt. The little patients were brought to his clinic in a state of collapse, with cold extremities, imperceptible pulse, and sunken eyes; the chloride of sodium injections were repeated from six to ten times at one sitting, as many as forty injections being administered during twenty-four hours. The result was surprisingly good, and without doubt in many cases saved the patient's life; those in a state of collapse recovering rapidly without any other treatment.—*Wiener med. Presse*, No. 47, Nov. 1888.

Treatment of Diphtheria.—DR. LICHTERMAN (*Bull. therap.*) gives an account of more than 300 cases of diphtheria treated by him at Bérézowka, in the government of Cherson (a country frequently visited by epidemics of diphtheria), by the following treatment:

Called to a patient, he selects the largest room in the dwelling and disinfects the same with chlorine gas.

After the lapse of one hour, the room having been ventilated, the patient is placed therein. Actual treatment begins with a mustard foot-bath of fifteen minutes duration, after which the patient is wrapped in woollen blankets and allowed to perspire for two or three hours. This bath is repeated every evening.

Local Treatment.—1st. Painting the interior of the throat four times daily, with a solution of salicylate of sodium and glycerin (salicylate of sodium 15 grains, glycerin 3j). 2d. Gargling every half hour with an aqueous solution of chlorate of potassium (chlorate of potash 3jss, water 3vj).

Internal Treatment.—Two mixtures—one white, the other red. The first is composed of: chlorate of potassium, 45 grains, water 6 ounces, simple syrup 1 ounce. The second of: hydrochloric acid 2 scruples, water 6 ounces, and raspberry syrup 1 ounce.

The patient takes every hour one tablespoonful of the white, and immediately afterward one tablespoonful of the red mixture. Children under one year take only a teaspoonful, and below that age only half a teaspoonful.

Expectoration is made into a dish containing a 5 per cent. solution of phenic acid. At the end of twenty-four hours the temperature becomes normal, and at the end of forty-eight hours the entire disappearance of the false membrane will be noticed.

The results which the writer obtained through this treatment are as follows: Up to the month of April, 1885, he treated his cases of diphtheria by the method then in general use, with a mortality of forty-two per cent. From April, 1886, to October, 1887, he treated 237 cases, sixty-eight of which were of the gangrenous variety. In these 237 cases he tried the treatment given above, with but four deaths, or seventeen per cent.

When called upon in October by the government to combat an epidemic then raging in the neighborhood of Bérézowka, he treated 47 cases, 8 of which died—forty per cent; these 8 cases having fallen ill five days previous to his arrival.

Dr. Lichterman gives the following theory for his treatment:

1. Under the influence of perspiration the patient's blood loses water and becomes richer in salts, which, according to Dr. Wachsmuth, leaves a poor medium for the development of diphtheritic microbes.

2. The administration of chlorate of potassium aids considerably in this concentration of the blood.

3. Under the simultaneous administration of hydrochloric acid and chlorate of potassium, an acid of chlorine is formed, which last acts very energetically as an oxidizer and microbe-destroyer.—*L'Abeille Médicale*, Nov. 19, 1888.

For the Constipation of Children.—

R.—Podophyllin $\frac{3}{4}$ gr.
Alcohol 3jss.
Syrup of marshmallow 3jv.—M.

One teaspoonful once daily.—*L'Union Médicale*, Nov. 20, 1888.

Cyanide of Zinc in Cardiac Affections.—DR. LASHKEWITSCH states that cyanide of zinc (zincum hydrocyanicum sine ferro) acts favorably in palpitation, in pain in the cardiac region, and in an irregular pulse due to

valvular insufficiency or a neurosis; its action being best marked in the last-named affection. This remedy will be found to be of special service when digitalis, convallaria, and other cardiac remedies seem to irritate the digestive organs. The dose is from $\frac{1}{15}$ to $\frac{1}{11}$ grain, taken once during twenty-four hours.—*Journal de Méd. de Paris*, Nov. 18, 1888.

Therapeutic Uses of Strophanthus.—At the meeting of the Académie de Médecine, Nov. 13, 1888, DR. GERMAIN SEE read a paper, by himself and DR. GLEY, upon the therapeutic uses of strophanthus. He states that the drug was used in all cardiac affections, in doses varying from $\frac{1}{15}$ to $\frac{1}{11}$ grain, with but little variation in the results.

1st. In mitral lesions, particularly in stenosis of the mitral orifice, less so in aortic insufficiency, the results were very favorable—that is, the cardiac action was greatly increased, as proved by the sphygmograph; from the start the pulse, which was at first depressed, small, and feeble, gradually gained in strength, the line of ascent at first nearly horizontal, becoming rapidly vertical, and that of descent, which at first was nearly effaced, being now only interrupted at a few points. The irregularities of the pulse disappeared. These phenomena were observed even when the heart had lost its force, no compensation remaining, and even when pulmonary and renal stasis with peripheral oedema existed. But in none of these cases was there any relief in the dyspnoea, nor increase of diuresis or diminution of the oedema.

2d. In all dilations and fibroid hypertrophies dependent upon a general sclerosis of the arteries, the same results were obtained, namely: an increase in the strength of the pulse and a return to the former general strength. No distinction was noticed between the maladies with *hyper-* or *hypo-*tension.

3d. In the painful affections of the heart and cardiac neuralgias, the administration of strophanthus proved harmful, by increasing the severity of the lesions.

4th. No disturbing action upon the stomach or brain was noticed; but at times slight vertigo was complained of.

DR. DUJARDIN-BEAUMETZ was of the opinion that in prescribing strophanthus it was essential to indicate what preparation was desired, as there were no less than six different tinctures in the market, all of which were of varying strength. These are Hardy's, Gallois's, Armand's, Traver's, Catillou's, and the one made in the laboratory of M. Chevreul.—*L'Abeille Médicale*, Nov. 19, 1888.

Ointment for Furuncles.—

R.—Red precipitate $1\frac{1}{2}$ grs.
Lanoline or vaseline 3ss.—M.

If a sty is to be treated, apply the ointment over the affected part and rub gently. In persons in whom the skin is soft and irritable, the amount of red precipitate can be reduced to $\frac{3}{4}$ or $\frac{1}{2}$ a grain. A single application of three or four minutes' duration will suffice to arrest the progress of small furuncles; and even where the furuncles are large, several applications made the same day will effect a cure. This ointment is also recommended for acne.—*L'Union Médicale*, November 3, 1888.

THE MEDICAL NEWS.

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SATURDAY, DECEMBER 15, 1888.

THE DIMINISHED MORTALITY OF THE PORRO-CÆSAREAN OPERATION.

A MOST extravagant claim for the Porro operation, rating its mortality at $13\frac{1}{3}$ per cent. for the two years 1886 and 1887, and giving for the same period a table of forty-five operations, appeared in the *Journal of Obstetrics and Gynecology*, of St. Petersburg, for December, 1887, from the pen of DR. C. J. CHAZIN. Had this statement remained in its original language, it would have been capable of only a local misleading, but it reappeared as a translation by Dr. Neugebauer, of Warsaw, in the *Nouvelles Archives d'Obstetrique et de Gynecologie*, of August 25, 1888, and this rendering into French will give the record a much wider publicity. We, therefore, feel called upon to point out the important errors contained in this record of the work of the two years in question.

Dr. Chazin finds fault with Professor Credé for comparing in his statement of the results of the "conservative Cæsarean operation," the work of the last five years under this method, with the general record of the last ten years under the Porro-Cæsarean operation, and proposes to make a fair comparison of the two by confining his attention to the better work under the latter, accomplished in the two named years. As the result of his research he produced a table of 45 Porro operations, with but 6 deaths, or $13\frac{1}{3}$ per cent., which he brought into competition with the Säger mortality, which he rated at 28 per cent.

The original table purports to present cases of the two named years, but, in fact, collects them from ten; no dates are given, but the references settle the question of the year when each operation took place. Having carefully examined the whole table and the references given, we are prepared to state:

1. That he has credited the operators with two cases too many, which reduces their number to forty-three. 2. That he has given twenty-five operations which were performed prior to January 1, 1886, viz., two in 1878, two in 1881, two in 1882, six in 1884, and thirteen in 1885. This reduction leaves him eighteen operations, with only two deaths, a very remarkable result, if there were no other cases in the two years. The published cases thus far recorded for the two years amount to thirty-one, of which twenty, with four deaths, belong to 1886, and eleven, with three deaths, to 1887. This will give a mortality of $22\frac{1}{3}$ per cent. for the two years. But this does not tell the whole truth, as cases are still to be reported, and these at present can only be obtained by correspondence.

We have only, after four years, completed the record of 1884, and to do this three statistical collectors were engaged in making private researches and combining their work. The year gives 28 Porro operations, with 15 deaths, a mortality of $53\frac{1}{2}$ per cent. The record of 1885 is as yet incomplete, but gives 22 cases with 6 deaths, a mortality of $27\frac{1}{3}$ per cent. Probably not more than half of the operations of 1887 have been published, and thus far the mortality is also $27\frac{1}{3}$ per cent.

The Säger-Cæsarean record for the whole world has been completed for 1887, and laboriously perfected by correspondence conducted by three statistical workers. The cases collected come from eleven countries, and number, in all, 47, with 10 deaths, a mortality of $21\frac{1}{3}$ per cent. This record thus fairly obtained, would appear to represent the "conservative Cæsarean operation" as it is now being performed in all countries collectively. The whole Säger record, as far as obtained, reaches 149 cases, with 41 deaths, a mortality of $27\frac{1}{2}$ per cent.; that of this country being 22 cases, with 13 deaths—a very damaging record to the general result, which, exclusive of the United States, shows a loss of less than 23 per cent. Contrasted with this, the Porro-Cæsarean record, which is not nearly so fully searched out, shows 232 cases, with 111 deaths.

The Porro operation has only recently commenced to show its true capability for saving life, and this

change for the better would appear to have begun with the year 1885. A very marked feature in recent records is the low death-rate in the children, which, in all Cæsarean work, has an intimate connection with a corresponding saving of the mothers. Four years ago we computed the maternal deaths under the Porro operation at 60 per cent., counting all the cases; but recent successes have probably brought down the general average to 50 per cent., and possibly a little lower. The Porro operation in Germany was very fatal in its early period to both mothers and children. Down to the close of 1884 there had been 28 operations, with 18 women and 10 children lost. Since the close of 1884 we have collected 11 cases to the credit of Germany, with only 2 deaths, one of which was by suicide; and nearly all of the children were saved. The Säger operations of Germany, by their marvellous successes (only 12 deaths out of 80), have taught a lesson in careful management which has been of decided benefit to the cases in which it was thought advisable to prefer the Porro method, and hence the lower death-rate in both mothers and children. The conservative Cæsarean operations of Germany for 1887 numbered 26 and the deaths 2, each of mothers and children. Dr. Chazin attributes the successes of Germany to the work of a few very skilful men, which we answer by the fact that the operations (80) were under 38 operators and in 18 cities and towns.

Austria developed much earlier than Germany the possibilities of the Porro method for saving life, and her record stands in remarkable contrast to that of the latter—30 women and 35 children having been saved under 44 operations, a mortality for the women of $31\frac{9}{11}$ per cent., which should have been lower, but for the fatal experiments of dropping in the cervical stump, as devised by Gustav Veit, of Bonn, in 1880.

It is an error to encourage any rivalry between the Porro and Säger methods, and we are glad to find that a choice is being made at times between them by the best operators, according to the special requirements of each individual case. Such noted men as Professor Leopold, of Dresden; Professor Chiara, of Florence; Professor Breisky, of Vienna; Professor Schauta, of Prague; Professor Schultze, of Jena; Professor Krassovsky, of St. Petersburg; and Professors Karl and Gustav Braun, of Vienna, do not hesitate to perform either operation, if they think it preferable at the time; and these operators have been marvellously successful in saving life under each

method. Mr. Tait, of Birmingham, is prejudiced in favor of the Porro operation, because he has had four successes and no failures, and, besides, is in favor of rendering the women sterile. His cases, with one exception, have not been reported in detail. The seven successes, in order, of Professor Breisky have not wedded him to the Porro operation; neither did his three failures, in order, prejudice him against the Säger method, as is shown by his fourth trial in October, 1887, the success of which introduced the method into the Krankenhaus of Vienna, where there have since been five more cases and no deaths.

There are those who object very decidedly to the Porro method, because it unsexes the woman; and these also oppose ligating the Fallopian tubes, or excising the ovaries, after the Säger operation. They contend that this method, to be "conservative," must not only preserve the life of the woman and fetus, but maintain her reproductive organs in their integrity. It is only occasionally that a Cæsarean woman bears a second child, and much more rarely a third; but they contend that she ought to be left capable of doing so if nature does not interfere. A second operation may be avoided in a large proportion of cases by the induction of premature labor, and the child may be reared, as long as required, in an incubator.

The Porro operation is certainly more fatal than the Säger, although but a fraction more so in the hands of the best Säger operators. The convalescence is more prolonged and the subsequent inconveniences greater. It should be preferred in cases of malacosteon, because the unsexing occasionally cures the disease. It should also be preferred, where practicable, in cases of obstruction by fibroids, but ought not to be resorted to where the pelvis is normal and the fetus impacted in a transverse position. It should be preferably employed where the fetus is dead and putrid; but such cases are apt to prove fatal, because of preëxisting sepsis. There is less objection to its performance in the cases of the unmarried than married, and where the induction of premature labor is unavailable by reason of a very short conjugate in the pelvis. To secure success, the patient should have a favorable pulse, temperature, and respiration, and her fetus should be vigorously alive. A supra-vaginal amputation of the uterus after rupture is not a Porro-Cæsarean section, as it is not *completive of the Cæsarean operation*, as designed by Professor Porro, and does not contemplate the

saving of two lives. There is one such case in the table of Dr. Chazin. The extra-peritoneal supravaginal amputation of the uterus is older than its Porro application, or that of Prevôt, of Moscow.

A DECISION IMPORTANT TO PHYSICIANS.

THE attention of our readers is called to the case narrated by DR. HUNT in the present issue of THE NEWS, and to the importance of the principle involved. The judicial decision establishes the point that a consultant called in by the attending physician to a patient separated from his family and mentally disabled, is entitled to just compensation.

In the case in question the consultant, who was also the ordinary medical attendant, was absent from town, and his advice was given by letter. Against the claim for compensation, it was objected that the consultant could not show contract with the patient, who did not personally summon him, nor was he called by a relative acting for the patient. The Orphans' Court, however, affirmed the contract on the ground of public policy, and awarded the claim; and further affirmed the right of the attending physician, under the circumstances, to summon counsel, if he deemed it desirable.

This establishment of one of the rights of physicians in relation to their patients is a matter of considerable importance. On the part of the medical man, the contract existing with his patient is scrupulously recognized. His best efforts, most careful study, mature knowledge and experience are faithfully given; but, in return, adequate compensation is often questioned, and occasionally refused. A suspicion of failure on the physician's part to meet fully his obligation is even, not infrequently, made the excuse for a suit for malpractice; and so commonly are medical services rendered gratuitously to public charities, that the claim that a contract exists into which compensation to the physician enters, is often regarded with surprise or even ignored. We knew of an experienced surgeon who, hence, never treated a fracture without previously obtaining his patient's signature to a paper limiting his responsibility in the case to that commonly recognized by the courts—average knowledge, skill, and faithful service; and we also recall the experience of a surgeon who presented a very small bill to a millionaire, and was met by a request to please itemize his account.

While the sense of justice common to men ordinarily recognizes the physician's faithful performance of his part of the contract, it is well that the courts

should establish clearly the fact that services rendered to a patient at his own request or at that of his relatives or friends or attendant, equally are given under contract and entitled to just compensation.

We congratulate the eminent surgeon who has had the courage to push this point until, finally, justice was obtained, upon the successful issue, and the profession are deeply indebted to him for establishing the important point of the right to compensation of a consultant under the not uncommon circumstances related.

THE new Hoagland Laboratory, situated at the corner of Henry and Pacific Streets, Brooklyn, will be opened this Saturday evening by an address to be delivered, at eight o'clock, by Prof. H. Newell Martin, M.D., of the Johns Hopkins University, after which the Laboratory will be inspected by the guests present.

IN the *College and Clinical Record* for December, just received, we notice a paper published as an *original* article, which is taken from our own columns of last September, and without any credit to the source of original publication. We are always happy to have the valuable papers which appear in THE NEWS noticed in abstract by our contemporaries, but a sense of propriety should prevent a contemporary from abstracting a paper *en masse*, and in infringement of the law of copyright.

DR. WILLIAM ROBERT SMITH, at a meeting of the Royal Medical and Chirurgical Society, held week before last, reported the results of his investigations carried on in the Brown Institution, on the etiology of puerperal fever. By the cultivation on gelatine of the blood of patients who had puerperal fever, he obtained, in two or three days, numerous colonies of a micrococcus, and from his experiments he drew these conclusions: 1. That this organism occurred in the blood of persons affected with puerperal septicæmia in considerable numbers in the form of streptococci. 2. That, culturally, differences of a marked character distinguished it from other streptococci. 3. That its action upon mice and rabbits was distinct and definite. 4. That it could be distinctly distinguished from the erysipelas streptococcus of Fehleisen and from the streptococcus pyogenes of Rosenbach.

WE regret to learn of the death of Dr. E. Headlam Greenhow, which occurred suddenly, from

syncope, in a London railway station. His name is well known in this country in connection with his valuable researches on diphtheria, chronic bronchitis, Addison's disease, and the pulmonary diseases of operatives. He retired from active consulting practice in 1881. He was in the seventy-fourth year of his age at the time of his death.

REVIEWS.

THE SURGEON'S POCKET-BOOK: AN ESSAY ON THE BEST TREATMENT OF THE WOUNDED IN WAR; ESPECIALLY ADAPTED TO THE PUBLIC MEDICAL SERVICES. By SURGEON-MAJOR J. H. PORTER, late 97th Regiment; late Assistant Professor of Military Surgery, Army Medical School, Netley. Third Edition. REVISED AND EDITED BY BRIGADE-SURGEON C. H. Y. GODWIN, Medical Staff; Assistant Professor of Military Surgery, Army Medical School, Netley; Late Medical Officer of the Royal Arsenal, Woolwich. 12mo. pp. 257. Philadelphia: P. Blakiston, Son & Co., 1887.

THIS capital little book has deservedly reached its third edition, this final one being under the clever editorship of Mr. Godwin, who has made such alterations and additions to the well-known work of Porter as to bring the book in almost all respects thoroughly up to the present times. Especially have the editor's efforts to remodel the work according to the principles of antiseptic and asepsis been fortuitous.

Although written more especially for the use of army surgeons, yet as a conspectus of surgery it will be found of great value also to students, hospital residents, ambulance surgeons, and, in fact, to any one; for besides being crowded with mention and illustration of all kinds of surgical resources and improvisations, the principles of surgical treatment, etc., are discussed in a thorough manner and conclusions of recognized and acknowledged soundness are therefrom drawn. To these are added many pages devoted to the formation, location, and transportation of field hospitals, their administration before, during and after engagement, the duties of the various officers of an army, and the general and special care of the wounded and sick under a great variety of circumstances. An appendix contains condensed information regarding food, water, ventilation and the general sanitation of troops and military hospitals. The illustrations are in the main good and sufficiently numerous.

Whilst our commendation is general, yet a few discordant assertions have arrested our attention in looking over the volume. Thus, we cannot agree with Mr. Porter in thinking a chisel and mallet and Hey's saw always preferable to the trephine, nor do we think his list of cases suitable for trephining sufficiently comprehensive. The statement, also, that ether is unsuited to military practice because of the cumbersome apparatus necessary for its administration is incorrect, although we do not deny that chloroform, even considering its greater dangers, may be the more practical anæsthetic for such purposes on account of the much less bulk of it which need be carried and its property of non-combustion.

Our only great disappointment has been to find the

sections upon treatment of intra-peritoneal traumata so grossly deficient and absolutely at variance with modern, and more especially American methods. This portion of the book, as well as that upon the treatment of peritonitis, we trust to find entirely re-written in another edition. We are glad to notice the editor's condemnation of the use of poultices upon any kind of wound, and his significant advice that "any dressing had better be omitted rather than have it applied with dirty fingers or dirty water" even in heat of action. It is a source of satisfaction to know that in time of need such a thoroughly good, comprehensive, yet very portable book would be available; for its small size admits of carrying it in the breast-pocket, and we are inclined to think that it would prove a very efficient protection to the war surgeon, and especially to the vital region of his heart were it carried in the left breast-pocket.

CORRESPONDENCE.

THE RIGHTS OF A CONSULTANT TO COMPENSATION.

To the Editor of THE MEDICAL NEWS,

SIR: I am happy to be the medium of giving to the profession the following very important decision of the Orphans' Court of Philadelphia County.

The circumstances of the case were these: In the summer of 1886, a business gentleman of large means, a patient of mine for many years, consulted me about some vague head symptoms. I advised him to give up business altogether for a time and to take a vacation with me. This he declined, as his business was too pressing.

Nothing occurred of any moment until after I had left the city to take my summer vacation. While at Bar Harbor I received a letter from Dr. Albert Fricke, whom the patient consulted in my absence, asking for information and advice. I answered at once. The case took a very serious turn, and within three weeks the patient was dead. During all the time of the sickness, however, a constant consulting correspondence was kept up with me.

One of our large trust companies was the executor of the decedent's estate, and to it I sent my bill.

The residuary legatee of the estate was in Europe at the time of the sickness and death, and of her own knowledge knew nothing whatever of the facts. She came home, and one day the Trust Officer of the Company said to me: "Doctor, I wish you would get the endorsement of Mrs. — on this bill as correct, and we will pay you." I assented, and called at the house, expecting, if I expected anything, to be received with some expression of thanks for the care which was taken of her brother in his loneliness and extremity, for during his sickness he was living in the house with servants only.

Instead of this, I and the doctors who attended her brother were roundly denounced in unsparing terms, and she positively refused to endorse my bill. I have met with some strange experiences in a doctor's history during my professional life, but never with anything quite equal to this. I understood Judge Ashman to say that a case precisely like this has not been adjudicated before. The reason probably is that the opportunity rarely occurs. The common sense of justice in mankind mostly settles such questions, but here was one of the exceptions. There was nothing for me to do but to bow

myself out of the house, and to wait for the adjudication of the case before the Orphans' Court.

At this adjudication, the counsel for the accountant took the ground that Dr. Fricke acted on his own motion in consulting with me; that the patient was well enough when the doctor (Fricke) first saw him to ask, or to insist on his consulting with me if he wished him to do so. To my surprise, the auditing judge decided that as I had shown no contract with the patient I could not recover my bill, and that the attending physician had no authority to employ me. An appeal was immediately taken with the subjoined result, with which I must state the judge first hearing the case was, on review, fully in accord, and the judgment of the bench was unanimous.

The result, I am sure, most people will think is in accordance with public policy, with justice, and with humanity.

WILLIAM HUNT.

PHILADELPHIA, Dec. 5, 1888.

"Sur Exceptions to Adjudication.

"Opinion by ASHMAN, J. December 1, 1888.

"Two principles, so commonly accepted, that they do not require to be vouched by individual authorities, seem to establish the right of the exceptant to recover. One is, that a principal will be bound by those acts of his accredited agent, which are reasonably incident to the full performance of the contract of service; and the other, that he will be bound by the acts of a self-constituted agent where his own neglect or the act of God, has rendered those acts necessary for his self-preservation, or for the well-being of society. The first was an ingredient in every contract of agency, under the civil law, and the second is largely due to modern ideas of humanity, but each has an equal and just claim upon our common sense. The cases of *Fenn v. Harrison*, 3 T. R. 757, *Nelson v. R. R. Co.*, 48 N. Y. 498, and *Richard v. Cartwright*, 1 C. & Kir. 328, are strongly illustrative of the first of these rules. One of them decided that a broker, entrusted with a note for discount, may endorse it in the name of his principal; another that a carter employed to deliver a mirror to a common carrier, may sign a release for the shipper and owner, against liability for breakage; and the third, that a foreman, without special authority, may bind his employer, by contracting to deliver certain goods at a designated time.

"The spirit in which this rule is to be expounded should be in unison with the character and relations which the parties have themselves established with each other, and should be liberal just in proportion as those relations become more intimate and involve delicate questions of duty and responsibility. To say that the discretion to act promptly in an emergency, which a patient necessarily gives to his physician, is larger than that which a merchant gives to his drayman, is simply to say that a man will resign more of his own authority to the will of the person who is to save his life, than to that of the person who is to take care of his trunks. The trust, which includes the power for its exercise with which the patient vests his physician, is often practically unlimited, because it may require to be executed at a time when disease has taken away all ability to restrict it. The patient is not to be left to die, on the plea that during such an interval, no act of his adviser can be valid, for want of his direct approval. Or, the doctor may suspect the presence of an obscure disease, which, if it exists, demands heroic treatment. To communicate the suspicion

to the sick man will probably finish him on the spot; may he not solve the doubt by consulting a specialist?

"But the case in hand is not even so problematical as the case which has just been supposed. The decedent, when he first consulted the claimant, was affected with a brain disorder, which culminated in paralysis, and killed him in three weeks. His powers of thought and speech were so far impaired that it was impossible to communicate intelligently with him as to his past symptoms or as to measures for the future. His sole next of kin was a sister, who was travelling in Europe, and his only attendants were servants. His family physician was in New England. The doctor who was called in by the business partner of the decedent, knew nothing of his patient's medical history; and he wrote for information upon that point and for professional advice, to the claimant, who had attended the patient for years, and who at once responded. If the right, in the consulting physician, to compensation for his services, is without legal merit, then the law is a reproach to conscience. That it has not been passed upon hitherto, means nothing; or rather, it means that it has never been questioned, any more than the right of the physician to charge his patient with the drugs he has purchased, or the nurse he has hired for him, when drugs and nursing were indispensable to his recovery.

"The doctrine, however, upon which the claim is now to be adjudicated, has been repeatedly enforced. It is the doctrine of public policy. In its application the courts have held that a parent who leaves his child in the care of a servant, will be liable to the surgeon who dresses a wound received by the child, although the surgeon was called in by the servant, and although the injury was caused by the servant's neglect: *Cooper v. Phillips*, 4 Car. & P. 581. They have also held, that a husband who abandons his wife, or leaves her even with her own consent, is liable for the necessities which a third party may furnish for her support: *Reed v. Moore*, 5 Car. & P. 200; *Harris v. Morris*, 4 Esp. 41; that the estate of a decedent is liable for the expenses of a funeral provided by a stranger: *Rogers v. Price*, 3 Y. & Jer. 28; and the estate of a lunatic for services rendered in protecting his person or estate, *Williams v. Wentworth*, 5 Beav. 325, *Bagster v. Earl of Portsmouth*, 2 Car. & P. 178, or in supporting his family, *Elwyn's Appeal*, 17 P. F. Sm. 367. It is not necessary, for the purposes of this argument, that the decedent should answer to the legal definition of a lunatic. If he was so far mentally disabled as to be unfitted for the proper conduct of his affairs, it was sufficient to justify the action of the claimant: *Young v. Stevens*, 48 N. H. 135; *Dennett v. Dennett*, 48 Id. 531. We do not mean to displace the rule of liability from its footing of strict necessity. The burden of proof that in the absence of an express contract, an implied contract has arisen from the exigencies of the case, must always rest upon the claimant. But that burden was fully met in this instance; and we think that the claim should have been allowed.

"The exceptions are therefore sustained."

THE TREATMENT OF VALVULAR DISEASES OF THE HEART.

To the Editor of THE MEDICAL NEWS,

SIR: In reading Prof. J. M. Da Costa's valuable article on the "Treatment of Valvular Diseases of the Heart,"

in the November issue of *The American Journal of the Medical Sciences*, I notice, on page 444, the following sentences: "Now, we must remember that the very remedy we use most in cardiac disease, digitalis, contracts the arteries and arterioles, and the indications are often to get with increased cardiac power a free flow in the vessels without resistance from them. No remedy does this, and a certain remedy of the kind is greatly needed."

Now, during the past fifteen years, I have been using in such cases a tincture of *Cactus grandiflorus* with the happiest results. I think, if we have a heart tonic, pure and simple, it is *Cactus grand.* By its continued use the nutrition of the heart is improved, and the organ is permanently strengthened. I have not found it disagree with the stomach, even after using it for months at a time.

In valvular disease, where the dilatation has outstripped the compensatory hypertrophy, I have found this remedy more satisfactory than digitalis. In that form of cardiac disease called by Dr. Da Costa "functional valvular disease," *cactus* is now the only "heart" remedy I use. When there is a fault in the cardiac innervation, the heart's action being tumultuous, irregular, intermittent, feeble, the patient nervous, restless, and dreading some impending danger, the continued use of *cactus* will almost invariably give permanent relief.

I use a tincture made from the fresh plant, giving from one to five drops every two, four, or six hours.

Respectfully yours, C. L. GREGORY, M.D.

YREKA, CAL., Nov. 22, 1888

NEWS ITEMS.

Scarlet Fever in Relation to a Glasgow Milk Service.—Dr. J. B. Russell reports the occurrence of another outbreak of scarlet fever associated with the use of milk from a special dairy. The occurrence was practically limited to a well-to-do part of the city; and, after local investigation into the distribution of the milk from two separate shops, and by means of vans and carriers, it appears that of three hundred and thirty-six families thus supplied twenty-nine were infected, and forty-three cases resulted. It is also noteworthy that of a total of fifty-six cases of scarlet fever heard of between Sept. 25th and Oct. 31st last, as many as forty occurred with unwonted suddenness in the three days Oct. 18th to 20th.

The story told by Dr. Russell is a complicated one, but the salient points may be summarized as follows: At one of the two milk shops lived a family, some members of which had suffered from scarlet fever whilst away from home, between Aug. 17th and Sep. 18th, when they returned to the shop, to remain there until the 26th. During this time it is impossible to conceive that they could have been free from infection, for even as late as Oct. 22d one child was found to be still desquamating on his feet, and another is stated to have been pulling bits of skin off his hands on Sept. 22d. Notwithstanding this, and although there was free communication between the residential part of the house and the dairy, no material (if indeed any) mischief appears to have accrued to the milk supply. But it is held that there are strong grounds for believing that during what must be regarded as an exceptionally dangerous period the infection became communicated to the second dairy shop, where sore

throats and ill-defined ailments are admitted to have existed; and that it was essentially through the agency of these sufferers that the milk supply became infective. Incidentally, several points of interest are noted. In the first place, examination of the cows elicited no information as to disease. In the next place, there was a greater incidence of the scarlet fever in that branch of the business which carried milk to the largest houses, and Dr. Russell expresses his conviction that, whilst all users of the milk risked infection, the risk rose and fell with the quantity used.

The great lesson which the reporter desires to enforce is the folly of mixing up the milk business with family life. In this case the fortunes of two families were so interlaced with a milk distribution as to have insured risk on any chance occurrence of infectious disease. It is also noteworthy that the most trifling ailments, whether of man or beast, must not be thought beneath attention where milk supplies are in question. Recent research into the relation of diseases in the cow to the consumption by man of milk has abundantly shown this as regards the lower animals, and Dr. Russell's story enforces it again as to those minor throat ailments in the human subject which appear to be so trivial, but which are often singularly potent in their infectiveness.

The occurrence recorded is regarded as having been brought about by some ill-defined throat affections, and the result of consuming the milk was not only that of inducing the series of well-marked scarlet fever attacks to which we have referred, for there also followed in the line of the milk distribution a "cloud" of undefined but plainly specific illnesses of the nature of sore throat, vomiting, diarrhoea, etc.—*Lancet*, Dec. 1, 1888.

A Sextuple Birth.—A woman in Navarro County, Texas, is stated to have lately given birth to six living children, four boys and two girls, one of the latter being slightly deformed.

Quinine Depreciation.—Eight years ago the manufacturer's price for sulphate of quinine was ten and twelve shillings per ounce, while to-day it is worth about two shillings per ounce. This is perhaps one of the most remarkable instances of depreciation in the commercial value of a drug on record. This fall of price is, we are informed, due to the great extension of cinchona cultivation in Ceylon, which has of recent years been brought about. This go-ahead colony, on finding its coffee trade falling into decay, took to planting cinchona and tea trees, and in a few years this has proved very successful. It is estimated that, of a total demand of twenty-two million pounds of cinchona bark a year, fifteen millions now come from Ceylon. Moreover, the yield of the alkaloids from the Ceylon bark is much greater than that of any other country; the South American product being, we believe, the next competitor.—*Medical Press*, November 28, 1888.

Bacteria in Glaciers.—Dr. SCHMELCK, of Christiana (*Centralblatt f. Bacteriologie*), has found immense numbers of bacteria on the Jerstedalsbræ, the largest glacier in Europe, as well as in the waters of rivers which receive water from the melting glaciers and snow. During their growth these bacteria formed a substance of a fluorescent color.

Under the microscope they appeared to be of the forms of small moving sticks, and resembled during their growth the fluorescent liquefacient bacillus. The writer finds a connection between the presence of these bacteria in the glacial regions and the greenish tints of the waters coming from these regions. During the melting of the ice, these bacteria grow with great rapidity. —*L'Union Médicale*, Nov. 22, 1888.

A Novel Precedent.—It is stated in *The Medical Press*, Nov. 28, 1888, that Mr. Bruce Clarke, of St. Bartholomew's Hospital, has recently been called into requisition by Sir Frederick Johnstone, in the treatment of his valuable horse "Friar's Balsam." Shortly before the last Derby "Friar's Balsam," which was the favorite, developed an abscess in connection with its lower jaw, the results of which incapacitated the horse from taking part in any engagements up to the present moment. A piece of loose necrosed bone having recently been detected, the operation of sequestromy became necessary, and it was for the purpose of carrying out this procedure in conjunction with the illustrious equine patient's ordinary veterinary attendants that the services of Mr. Clarke were secured. The operation was successfully performed recently, and presented no difficulty; the most noticeable feature in connection with it being the large amount of new bone which had formed round the sequestrum. It had been decided to administer chloroform in the event of the patient proving to be refractory, but the somewhat trying ordeal was patiently submitted to, without necessitating the use of the drug, and was completed in the course of about half an hour.

We presume that the operation of sequestromy would scarcely differ in detail to that which is performed by surgeons upon human patients, whether it happened to be required for the alleviation of the sufferings of a horse, a cow, or other animal. But the case probably would be different, if for instance a nephrotomy, or nephrectomy upon, say, a valuable mare, was ever deemed to be essential; undoubtedly, the great experience of this and other operations which some surgeons have gained would be of the utmost assistance, if not absolutely essential. But probably there would be difficulty about the horse's anatomy, and this would conceivably have to be taken into consideration. If, however, the precedent which Sir Frederick Johnstone has established comes to be followed largely in the future, operating surgeons, who have identified themselves with any particular procedure, might find it to their advantage to read, mark, and learn the various points of anatomical detail in connection therewith in the lower animals. There is surely no reason why animals of great value to their owners should not benefit by the experience of human surgery, in the same manner as man has become indebted to animals through the knowledge which has been evolved from them by experimental inquiry.

ACCORDING to the *Med. chirurg. Rundschau*, Nov. 15, 1888, the Queen of Sweden has been ordered by her physicians to rise early, make her own bed, clean and dust her own room, then to take a brisk walk in her garden, return for breakfast, and subsequently to pass the greater part of the day out of doors. Her Highness follows these instructions to the letter, and finds that her nervousness is fast becoming a thing of the past.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM DECEMBER 4 TO DECEMBER 10, 1888.

WILLIAMS, JOHN W., *Major and Surgeon* (U. S. Army).—Is hereby relieved from further duty with the battalion of the Second Artillery, at Fort Wadsworth, New York Harbor, and will proceed to join his permanent station, Jackson Barracks, La.—Par. 3, S. O. 256, *Headquarters Division of the Atlantic, Governor's Island, New York City*, December 5, 1888.

TOWN, FRANCIS L., *Major and Surgeon*.—Is relieved from duty at the post of San Antonio, Texas, and will report in person to the commanding officer Presidio of San Francisco, California, for duty at that station, relieving Major and Surgeon Henry B. Tilton, and by letter to the commanding general Department of California.—Par. 19, S. O. 286, A. G. O., *Washington, D. C.*, December 8, 1888.

TILTON, HENRY R., *Major and Surgeon*.—Upon being relieved by Major Town, will proceed to West Point, New York, and report in person to the Superintendent of the U. S. Military Academy, for duty at that station, relieving Major and Surgeon Charles F. Heizmann.—Par. 19, S. O. 286, A. G. O., *Washington, D. C.*, December 8, 1888.

HEIZMANN, CHARLES F., *Major and Surgeon*.—Upon being relieved by Major Tilton, will proceed to San Antonio, Texas, and report in person to the commanding officer of that post for duty, and by letter to the commanding general Department of Texas.—Par. 19, S. O. 286, A. G. O., *Washington, D. C.*, December 8, 1888.

FINLEY, JAMES A., *Captain and Assistant Surgeon*.—Is relieved from duty at Fort Buford, Dakota Territory, to take effect upon the expiration of his present sick leave of absence, and will report in person to the commanding officer at Fort Assiniboine, Montana, for duty at that post.—Par. 19, S. O. 286, A. G. O., *Washington, D. C.*, December 8, 1888.

JOHNSON, RICHARD W., *Captain and Assistant Surgeon*.—Is relieved from duty at Fort Adams, Rhode Island, and will report in person to the Superintendent of the U. S. Military Academy, West Point, New York, for temporary duty at that station.—Par. 19, S. O. 286, A. G. O., *Washington, D. C.*, December 8, 1888.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF THE MEDICAL CORPS OF THE U. S. NAVY, FOR THE WEEK ENDING DECEMBER 8, 1888.

BRANSFORD, J. F., *Surgeon*.—Detached from the Smithsonian Institution, and granted six months' leave, with permission to go abroad.

OFFICIAL LIST OF CHANGES OF STATIONS AND DUTIES OF MEDICAL OFFICERS OF THE U. S. MARINE-HOSPITAL SERVICE, FOR THE TWO WEEKS ENDING DECEMBER 8, 1888.

STONER, G. W., *Surgeon*.—When relieved, to proceed to Detroit, Mich., and assume charge of the Service, November 26, 1888. Granted leave of absence for thirty days, November 28, 1888.

CARMICHAEL, D. A., *Passed Assistant Surgeon*.—Granted leave of absence for thirty days, November 27, 1888. Relieved from duty at Washington, D. C., and ordered to Marine Hospital, Wilmington, N. C., December 3, 1888.

DEVAN, S. C., *Passed Assistant Surgeon*.—Detailed as Attending Surgeon and acting Chief Clerk Marine-Hospital Bureau, December 3, 1888. Granted leave of absence for eight days, December 8, 1888.

URQUHART, F. M., *Passed Assistant Surgeon*.—To proceed to Evansville, Ind., for temporary duty, November 30, 1888.

BROOKS, S. D., *Passed Assistant Surgeon*.—Granted leave of absence for thirty days, December 8, 1888.

SEATON, NORMAN, *Assistant Surgeon*.—Ordered to examination for promotion, November 27, 1888. Granted leave of absence for twenty-five days, December 8, 1888.

FATTIC, J. B., *Assistant Surgeon*.—Ordered to examination for promotion, December 7, 1888.

MAGRUDER, G. M., *Assistant Surgeon*.—Relieved from special duty at Way Cross, Ga., December 8, 1888.

KINYOUN, J. J., *Assistant Surgeon*.—Granted leave of absence for ten days, December 8, 1888.

VAUGHAN, G. T., *Assistant Surgeon*.—Granted leave of absence for twenty-three days, December 8, 1888.

GUIERAS, G. M., *Assistant Surgeon*.—To proceed to Savannah, Ga., for temporary duty, December 3, 1888.